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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AND CERTAIN INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE
ONE HUNDREDTH CONGRESS
FIRST SESSION
ON

H.R. 2783

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AND FOR SUNDRY INDEPENDENT AGENCIES, BOARDS, COMMISSIONS, CORPORATIONS, AND OFFICES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1988, AND FOR OTHER PURPOSES

PART 3 (Pages 1291–2030)

NONDEPARTMENTAL WITNESSES

Printed for the use of the Committee on Appropriations

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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

FRIDAY, MAY 8, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:31 a.m. in room SD–142, Dirksen Senate Office Building, Hon. William Proxmire (chairman) presiding.

Present: Senators Proxmire and Lautenberg.

Also present: Messrs. Thomas van der Voort and David Schnare.

NONDEPARTMENTAL WITNESSES

OPENING REMARKS

Senator PROXMIRE. The subcommittee will come to order. First, I want to apologize for being tardy. I had to be on the floor of the Senate to speak. I thought I could speak shortly after 10, but there was another Senator even windier than I am who spoke and that delayed me.

Today, we will hear from a number of public witnesses regarding the budgets of the Environmental Protection Agency, the National Science Foundation, and the Federal Emergency Management Agency. Most of the testimony will recommend budget increases. Before you begin, I want to underscore the difficulty of adding to the administration's budget proposals because of the severe constraints imposed by Gramm-Rudman-Hollings.

Should you ask for increased funding, I hope you will be prepared to indicate where the money to pay for the increase might come from, keeping in mind that under the Budget Act, the subcommittee must find offsets within other programs falling under its jurisdiction.

HEARING PROCEDURES

Before we begin, I want to go over the procedures we will use. Because of the large number of witnesses, each witness will have 4 minutes in which to present his or her testimony, which will be printed within the record in its entirety.

When 1 minute is left, the yellow light up here will come up. When the time is up, the red light will come on.

Our first witness is Beth Moten, who is legislative liaison of the National Federation of Federal Employees, who will testify on the budget of the Federal Emergency Management Agency.

Ms. Moten, go right ahead.

FEDERAL EMERGENCY MANAGEMENT AGENCY

STATEMENT OF BETH MOTEN, LEGISLATIVE LIAISON, NFFE LOCAL 1983, NATIONAL FEDERATION OF FEDERAL EMPLOYEES

Ms. MOTEN. Good morning, Mr. Chairman. Thank you. On behalf of the National Federation of Federal Employees, which represents a substantial number of employees and many agencies falling under this subcommittee's jurisdiction, I appreciate the opportunity to present our concerns about the funding of these agencies. Today, our primary focus will be on the Federal Emergency Management Agency.

We are quite concerned about the Director of FEMA's recent decision to disestablish the Training and Fire Programs Directorate and to create an Office of Training, reporting directly to Director Becton, and to transfer the U.S. Fire Administration to FEMA Headquarters in Washington, DC. The USFA move will affect more than 20 employees.

Furthermore, the creation of the Office of Training could potentially result in the transfers of as many as 30 to 35 other employees who are in the field division of the Emergency Management Institute and the Offices of the Associate Director of Policy and Planning, Procurement and Programs, and Academics.

It is not yet known how much such a transformation would cost. Furthermore, an examination of the history of FEMA, the Federal Fire Prevention and Control Act of 1974, and the role of the Joint Council of Fire Services Organizations' preservation of the federal fire programs causes even greater concern.

Public Law 93–498 established the National Fire Prevention and Control Administration, later called the U.S. Fire Administration and the National Academy for Fire Prevention and Control, which is now called the National Fire Academy, both of which became operational under the Department of Commerce in 1978. President Carter submitted Reorganization Plan No. 3 of 1978 for approval by Congress, which proposed the transfer of the federal fire programs from Commerce to a new agency to be called the Federal Emergency Management Agency.

STRUCTURAL FOCUS OF FEMA

During the 1978 congressional oversight hearings, many concerns were raised by the House and Senate committees about the structural focus of FEMA, which combined five separate federal emergency preparedness programs, including USFA and NFA into the new agency. In the hearings, much concern was raised by the Joint Council of National Fire Service Organizations about the loss of integrity and authority of the federal fire programs in an agency whose primary mission is emergency preparedness and civil defense.

The JCNFSO received assurances from the White House which were clearly understood by the House and Senate oversight committees that the USFA/NFA would remain intact in its structure, authorities, and program focus.

In 1981, former FEMA Director Louis Giuffrida established the Training and Educational Directorate and renamed the National Fire Academy in Emmitsburg, MD, the National Emergency Training Center. Giuffrida assumed that all of the authorities of the U.S. Fire Administrator and NFA Superintendent found in Public Law 93–498 were vested in the Director and could be delegated as seen fit. At the request of Fred Villella, Associate Director of the TED, Giuffrida delegated to him the authorities of the NFA Superintendent. Under the provisions of the law and given the commitments from the White House and Congress in 1978, Giuffrida had no legal right or authority for these actions.

Current FEMA Director Julius Becton has also assumed these authorities and announced in a memorandum on February 2, 1987, his decision to disestablish TFPD and create a new Office of Training located in Washington, DC, headquarters. In effect, we believe that FEMA has circumvented the authorizing intent of Public Law 93–498 by distribution of funds specifically dedicated to fire programs and to other nonfire organizational activities and programs.

As a result of these actions on the part of FEMA management, NFFE urges the committee to direct the agency to return the organizational structure to that mandated in Public Law 93–498 and properly dedicate authorized fire program funds solely for USFA/NFA activities in Emmitsburg, MD.

Mr. Chairman, that concludes my statement.

Senator PROXMIRE. Thank you very much. We have language in our report in the supplemental which delays the Fire Administration reorganization pending a benefit/cost study. I want to thank you.

Ms. MOTEN. Thank you very much.

Senator PROXMIRE. You met the deadline, doing it beautifully.

[The statement follows:]

STATEMENT OF BETH MOTEN, LEGISLATIVE LIAISON, NATIONAL FEDERATION OF FEDERAL EMPLOYEES

Mr. Chairman and Subcommittee Members:

On behalf of the National Federation of Federal Employees, which represents a substantial number of employees in many agencies falling under this Subcommittee's jurisdiction, I appreciate the opportunity to present our concerns about the funding for these agencies. Today our focus will be on two agencies in particular: the Environmental Protection Agency and the Federal Emergency Management Agency. I am accompanied by Ed Kaplan, President of NFFE Local 1983 at the National Emergency Training Center in Emmitsburg, Maryland.

First I would like to discuss our concerns about FEMA. We are quite concerned about the director of FEMA's recent decisions to "disestablish" the Training and Fire Programs Directorate (TFPD) and to create an Office of Training reporting directly to Director Becton, and to transfer the U.S. Fire Administration to FEMA headquarters in Washington, D.C. The USFA move will affect nearly twenty employees. Furthermore, the creation of the Office of Training could potentially result in the transfer of as many as 30-35 other employees who are in the field division of the Emergency Management Institute and the offices of the associate director, policy and planning, procurement and programs, and academics. It is not yet known how much such a transformation would cost. Clearly, the lives of many people, in addition to the USFA employees, stand to be substantially disrupted by this reorganization; moreover, the organizational structure of NETC could look significantly different under the FEMA Office of Training. Furthermore, an examination of the history of FEMA, the Federal Fire Prevention and Control Act of 1974 (Public Law 93-498) and the role of the Joint Council of Fire Service Organizations' preservation of the Federal fire programs causes even greater concern over FEMA's plan.

The Federal Fire Prevention and Control Act of 1974 (P.L. 93-498) (Attachment A) established the National Fire Prevention and Control Administration, later called the U.S. Fire Administration and the National Academy for Fire Prevention and Control, now called National Fire Academy (NFA) both of which became operational under the Department of Commerce in 1978. President Carter submitted Reorganization Plan No. 3 of 1978 for approval by Congress which proposed the "transfer" of the Federal fire programs from Commerce to a new agency to be called the Federal Emergency Management Agency (FEMA).

During the 1978 Congressional oversight hearings (Attachments B and C), many concerns were raised by the House and Senate committees about the structural focus of FEMA which combined five separate federal emergency preparedness programs, including USFA/NFA, into the new agency. In the hearings, much concern was raised by the Joint Council of National Fire Service Organizations (JCNFSO) about the loss of integrity and authority of the federal fire programs in an agency whose primary mission is emergency preparedness and civil defense. The JCNFSO received assurances from the White House, which were clearly understood by the House and Senate oversight committees, that the USFA/NFA would remain intact in its structure, authorities and program focus. After approval from Congress in 1978, Executive Orders 12127 (March, 1979) (Attachment G) and 12148 (July, 1979) were subsequently issued to implement the president's reorganization plan.

In 1981, former FEMA Director Louis O. Giuffrida established the Training and Educational Directorate (TED), subsequently called the Training and Fire Programs Directorate (TFPDP), and renamed the National Fire Academy facility in Emmitsburg, Maryland the National Emergency Training Center (NETC). Giuffrida assumed that all the authorities of the U.S. Fire Administrator and NFA Superintendent (Attachment E) found in P.L. 93-498 were vested in the director and could be delegated as seen fit. At the request of Fred J. Villella, Associate Director of the TED, Giuffrida delegated to him the authorities of the NFA Superintendent (Attachment D). Under the provisions of the law and given the commitments from the White House and Congress in 1978, Giuffrida had no legal right or authority for these actions.

Current FEMA Director Julius W. Becton, Jr. has also assumed these authorities and announced by memorandum on February 2, 1987 (Attachment F) his decision to "disestablish" TFPD and create a new Office of Training located in Washington, D.C. headquarters. The decision encompasses three components: 1) transfer the USFA to FEMA headquarters; 2) place the NFA and Emergency Management Institute under FEMA's Office of Training; and 3) separate the NETC site administration functions of the Emmitsburg, Maryland training center from the Office of Training.

The following is a representation of how FEMA has altered the funding patterns of P.L. 93-498 from 1979 to the present:

1979-80	Legislated Track	Congress > FEMA > USFA/NFA (Emmitsburg)
1981-present (Guiffrida/ Becton)	Existing USFA/TFPD/ NETC Track	Congress > FEMA > USFA > NETC > TFPD > NFA > TFPD/other NETC activities
Proposed track (Becton)		Congress > FEMA > USFA (Washington) > OT > NFA (Emmitsburg) > OT > supporting FEMA training programs in other locations > NETC site administration (Emmitsburg)

The redirection of funds as outlined above demonstrates how FEMA has circumvented the authorizing intent of P.L. 93-498 by distribution of funds specifically dedicated to fire programs into other non-fire organizational activities and programs.

In conclusion, records of legislative history and White House commitments and statements before Congress support the position that the Director of FEMA does not have the authority to separate the USFA/NFA as proposed nor extend fire program funds in support of FEMA's non-fire training mission. In Reorganization Plan No. 3 of 1978 and the subsequent Executive Orders, the transfer of "functions" from one agency (Commerce) to another (FEMA) is not the same as "authority." In recognition of this fact, there is no provision in P.L. 93-498 that ever gave the Secretary of Commerce the authorities of the U.S. Fire Administrator or NFA Superintendent. Since the Secretary of Commerce did not have these authorities, it cannot be assumed that the Director of FEMA has them.

Director Becton's decision to transfer the USFA to FEMA headquarters, place the NFA under the Office of Training, and make the Emmitsburg facility the agency's resident educational program is a violation of P.L. 93-498 and the intent of Congress asserted in 1978. Lacking proper authority to do so, the agency is misappropriating the funds authorized by Congress under the public law by expending fire funds for non-fire programs. The only reorganizational structure for the federal fire programs within FEMA which legitimately meets the will of Congress and public law is that whereby USFA serves as the parent organization of the NFA in Emmitsburg.

As a result of these actions on the part of FEMA management, NFFE urges the committee to direct the Agency to return the organizational structure to that mandated in P.L. 93-498 and properly dedicate authorized fire program funds solely for USFA/NFA activities at Emmitsburg, Maryland.

Now I would like to turn your attention to the Environmental Protection Agency. We have experienced several problems at the agency recently which concern us. First of all, last year's Superfund Act authorized a massive clean-up of toxic waste dumps. In the implementation of the act, EPA employees have been monitoring the clean-up by contractors of such waste sites. However, the ratio of contract dollars to EPA professionals monitoring the clean-ups is a startling $1.5 million to one working level professional. This ratio is outrageously low, and we urge the committee to appropriate funding to support a substantial increase in the number of professionals so that no field abuses will occur.

Second, the Superfund Act also called for the formation of an organization called the Agency for Toxic Substances Disease Registry. The ATSDR was given the task of undertaking the analysis of contaminants' risk to human beings around toxic waste sites. Approximately $500,000 was diverted from the normal function of EPA's Office of Toxic Substances to produce toxicological profiles needed to support risk analysis. Time has shown, however, that ASTDR does not have the technical expertise to fulfill the requirements of the analysis, and most of the work is continuing to be done by the Office of Toxic Substances. Yet the OTS no longer has the funding necessary to perform the task. NFFE urges the committee to redirect the funding for such risk analysis where the expertise is: at OTS.

Third, the Safe Drinking Water Act of 1987 requires the formulation of eighty-three new contaminant regulations by 1989. Yet despite the expanded responsibility created by the legislation, the President's FY 1988 budget calls for a reduction of five workyears from the FY 1987 levels. At a minimum, employment levels for FY 1988 for the Safe Drinking Water project should be maintained at FY 1987 levels.

Finally, space is a problem at EPA since the passage of the Superfund legislation. Only seventy-five to ninety square feet of office space is allotted per person working in the agency. The result of such cramped quarters is that employees performing highly technical work do not even have room for the books, materials, and manuscripts essential to perform their duties. We urge the committee to appropriate funding for additional space so that EPA employees can effectively carry out the agency's mission.

That concludes my statement. I will be happy to answer any questions.

SUMMARY OF SUPPORTING DOCUMENTATION AND RECORDS (Selected in Appropriate Part)

ATTACHMENT A: Federal Fire Prevention and Control Act of 1974 (PL 93-498)

"Section 7 (b) Superintendent - In exercising the powers and authority contained in this section the Superintendent (NFA) shall be subject to the direction of the Administrator (USFA)."

ATTACHMENT B: Senate Governmental Affairs Report on Reorganization Plan No. 3

p. 14 - "It is the committee's understanding that those organized fire service associations which have endorsed the transfer have done so as a result of assurances from the White House Reorganization Task Force team and from Mr. Greg Schneiders, Director of White House Projects, that the transfer will not affect the authorities, responsibilities, functions, activities integrity focus or organizational structure of the National Fire Prevention and Control Administration (NFPCA) as provided for in PL 93-498."

p. 15 - "All of the principal program authorities under the act will be assigned to the NFPCA in the new agency...The committee has been assured by OMB that it is not contemplated that the NFPCA, as a major operating unit of the new agency, will be assigned any direct responsibilities for functions not authorized in the Federal Fire Prevention and Control Act of 1974 (emphasis added).

p. 29-30- "Memorandum of Understanding Between the White House Reorganization Task Force Team and the Public Affairs Committee of the Joint Council of National Fire Service Organizations"

p. 30 (2) "All areas of responsibilities, activities and program presently provided by and authorized under Public Law 93-498 shall remain within the scope of the National Fire Administration with the new agency and these activities shall not be diffused in any manner throughout other areas of the new agency or any other agency."

p. 30 (3) "Present and proposed funding levels authorized by Congress shall remain with the NFPCA in its new structure within the new agency, and shall not be reduced, eliminated, diminished or diverted into other programs of the agency."

p. 30 (8) "The National Fire Academy shall remain as presently provided for in Public Law 93-498, a function of the proposed USFA..."

ATTACHMENT C: Hearings before a Subcommittee of the Committee on Government Operations House of Representatives, June 26 and 29, 1978.

Statement of James T. McIntyre, Director, Office of Management and Budget; Accompanied by W. Harrison Wellford, Executive Associate Director for Reorganization and Management; and Nye Stevens, Project Director, pages 9-71.

p. 14- "There are a number of fire service associations, Mr. Chairman, I might mention, that have given us a statement in support of this transfer...

p. 36 (question for the record)- (5) "If we pass the Plan in its present form, does that mean that a President can transfer these agencies in the future without coming back to Congress?"

(McIntyre response) "The Plan does preserve the President's present authority to make further adjustments to the organization of emergency responsibilities now vested in him. Congress has repeatedly confirmed the desirability of giving the President flexibility in carrying out civil defense, resource management and mobilization, and disaster assistance authorities, so that they can be swiftly realigned should emergency conditions require it. The fire prevention, emergency broadcast systems coordination and flood hazard reduction and insurance functions cannot be reassigned without Congressional approval (emphasis added)."

p. 63 (McIntyre statement)- "At this time we are not recommending any legislative changes to programs involved in the reorganization."

ATTACHMENT D: Memorandum from Associate Director for Training and Education Fred J. Villella to FEMA Director Louis O. Giuffrida, subject: Delegation of Authority (July 7, 1981)

"It is respectfully requested that the authority for that part of the law that pertains specifically to the National Academy for Fire Prevention and Control (PL 93-498, Section 7) previously delegated to the Administrator for the U. S. Fire Adminstration...be changed to indicate that the authority and responsibility of Section 7 of PL 93-498 is delegated to the Associate Director for Training and Education, Federal Emergency Management Agency. Perhaps this change can be incorporated in the changes in the CFR required by the recent FEMA realignment."

Memorandum from FEMA Director Giuffrida to Associate Director Villella, subject: Delegation of Authority (July 16, 1981)

"As authorized by Reorganization Plan No. 3 of 1978, EO 12127 and EO 12148, I hereby delegate the following authorities, responsibilities and functions to you as Associate Director: 1) the authorities at 44 CFR...previously assigned... and...2) the authorities set forth in section 7 of the Federal Fire Prevention and Control Act of 1974, as amended (15 USC 2201 *et seq*.) except that the authorities contained at paragraphs (a) and (b)..."

ATTACHMENT E: Memorandum from Louis O. Giuffrida to Clyde A. Bragdon, U. S. Fire Administrator, subject: Delegations of Authority (June 26, 1984)

"Pursuant to the authority vested in me as Director, I hereby delegate to you as U. S. Fire Administrator, the following authorities..."

ATTACHMENT F: Memorandum from Julius W. Becton, Jr. to all FEMA employees, subject: Organizational Changes (February 2, 1987)

ATTACHMENT G: Reorganization Plan No. 3 of 1978, Executive Orders 12127 and 12148

ENVIRONMENTAL PROTECTION AGENCY

STATEMENT OF SUZAN SHOWN HARJO, EXECUTIVE DIRECTOR, NATIONAL CONGRESS OF AMERICAN INDIANS

Senator PROXMIRE. Our next witness is Suzan Shown Harjo, executive director of the National Congress of American Indians, who will be testifying in regard to the HUD and EPA budgets.

Ms. HARJO. Thank you, Mr. Chairman. My name is Suzan Shown Harjo, and I am Cheyenne and Creek and the executive director of the National Congress of American Indians, which is the leading national Indian organization and the only Indian organization that represents Indian governments and Indian individuals.

We are greatly concerned, as we have complained to this subcommittee before, about the failure of the Environmental Protection Agency to carry out its November 1984 Indian policy. The rhetoric of that Indian policy, like the rhetoric of the President's Indian policy of 1983, is stellar. The actions, however, do not comport with the language of those policy statements; and the administration has never asked for any money to carry out Indian programs.

Even for this year, with the new environmental protections for Indian country, we do not see a request for Indian programs, and we would like very much to recommend that this subcommittee direct the EPA to do something to implement its policy and further to give the EPA permission through the appropriations process to enter into multimedia grants for Indian tribes—block grants—so that various tribal authorities in the environmental laws can exercise programs undertaken by the tribes with a single letter of credit, a single audit system. And you will be happy to know that this will save money. Rather than entering into various small grants for each tribe, combining them would be very helpful. EPA does not have that authority, and we think they should, and should be directed to use the authority once they are given it.

The Congress has directed in the Superfund legislation that, along with the President's fiscal year 1988 budget, that the administration provide to Congress a survey of hazardous waste sites in Indian country. So, that should have been completed on January 1987. It was not begun on January 5, 1987, and EPA and OMB, according to EPA, are trying to send to the Congress very soon a 1985 study that is inadequate and covers sort of an opinion poll covering roughly one-tenth of the Indian tribes.

We have a complete statement here, which I presume will be included in the record, and if we can provide any additional information of a written form to you or your staff, we would be happy to do so. Thank you for what you are able to do.

Senator PROXMIRE. Thank you very much. We appreciate that.

[The statement follows:]

STATEMENT OF SUZAN HARJO, EXECUTIVE DIRECTOR, NATIONAL CONGRESS OF AMERICAN INDIANS

Mr. Chairman and Members of the Committee, thank you for the opportunity to comment on the FY1988 budgets proposed by the Department Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA). This statement is presented on behalf of the National Congress of American Indians (NCAI), which is the oldest, largest and most representative national Indian membership organization. The NCAI serves a membership of American Indian and Alaska Native governments and people whose interests are directly affected by the HUD and EPA budgets, programs, policies and services.

ENVIRONMENTAL PROTECTION AGENCY

The EPA established an Indian policy, "EPA Policy for the Administration of Environmental Programs on Indian Reservations," in November of 1984. NCAI has recognized and commended EPA as the only federal agency to issue a stated position consistent with overall federal policy supporting tribal self-government and government-to-government relations between federal and tribal governments. This general federal policy was articulated in the President's September 1983 Indian Policy Statement. Despite the 1983 and 1984 stated policies, however, EPA has never asked Congress for an appropriation for tribal government involvement. It is our understanding that EPA has begun an effort to specifically identify funding for tribes within all EPA program activities in its budget preparation, but these efforts are not reflected in the proposed budget. Due to the absence of earmarked funds for Indian governments and the noticeable lack of mention of Indian governments in most program activities, NCAI questions EPA's commitment to fully implement its Indian policy. Adequate funding is absolutely essential to the development of tribal environmental programs.

American Indian and Alaska Native governments, representing the environmental conscience of the nation by the tribal cultures, religions and philosophies, have received only token assistance and resources from EPA to rehabilitate and protect our lands. Just last year, EPA began four pilot projects in Indian country. Our educational affilate, the NCAI Fund, is working with EPA to make available to the other Indian nations the experiences and results of these projects. The NCAI Fund also worked with two of the EPA Regions to conduct outreach and information sharing meetings in December of 1986 in Wisconsin and in January of 1987 in California with Indian governments whose territories border the states in EPA Regions V and IX.

While the EPA Indian Policy Statement, the four EPA pilot projects and the two regional outreach conferences have been positive steps, they must be followed by increased and designated funding from EPA programs.

The federally-recognized Indian governments have jurisdiction over nearly 50 million acres, or more than three percent of the national land base. Tribal governments have jurisdiction over 43,410,186 acres of rangeland and forests, 1,829,118 acres of dry farmland, 917,580 acres of irrigation farmland, 913,000 acres of water reservoirs and lakes, 45,352 reservoirs and impoundments, 3,199 natural lakes and ponds and 12,000 miles of perennial streams. Certainly the EPA should be willing to spend proportionately as much to protect Indian country environments as it does to protect the federal and state environments. This is an equitable and just request.

Indian tribes and national Indian organizations have sought amendments to the Safe Drinking Water, Clean Water and Superfund Acts which recognize the proper authority of Indian tribal governments to regulate and enforce environmental standards on Indian lands. These amendments recently have been enacted into law and, when implemented, should afford tribal governments a more appropriate role in participation in the federal regulatory framework in a manner consistent with the EPA Indian policy, with inherent tribal sovereign powers and with existing federal law and policy. The process for drafting the implementing regulations is of deep concern to all Indian peoples, and this should be undertaken on a direct government-to-government basis by EPA with Indian governments.

It is, therefore, critical at this time for Congress to exercise oversight review concerning the EPA to assure that Indian tribal governments receive environmental protection support equal to and consistent with the rest of the nation. There is a continuing need for technical assistance and training on a regional and national basis and expansion of staff resources to assist with the development of tribal environmental programs on Indian lands, to provide for consultation with tribes on program activities and decisions that affect the tribes and to coordinate activities with such other federal agencies as the Bureau of Indian Affairs (BIA) and the Indian Health Service (IHS).

A major obstacle for tribal governments seeking funding for environmental programs has been the lack of baseline data which accurately identifies the environmental problems and needs on Indian land. None of the agencies, including the EPA, BIA or IHS, have this comprehensive data, and EPA's attempts to gather information have been woefully inadequate. EPA, BIA and IHS need to coordinate efforts to conduct surveys which identify drinking water problems, hazardous waste sites and other environmental problems affecting Indian resources and peoples. In turn, these surveys also should identify adequate funding levels to properly address and document tribal environmental needs, needs which we know are enormous.

The reauthorized Superfund law, P.L. 99-499, contains language directing EPA to conduct a survey of hazardous waste sites on Indian lands, but it appears that EPA does not intend to comply with this Congressional mandate. P.L. 99-499 states: "The Administrator or his agent shall conduct a survey, in consultation with Indian tribes, to determine the extent of hazardous waste sites on Indian lands. Such survey shall be included within a report which shall make recommendations on the program needs of tribes under the Act, with particular emphasis on how tribal participation in the administration of such programs can be maximized. Such report shall be submitted to Congress along with the President's budget request for FY1988." The FY1988 budget request was submitted on January 5, 1987, but the EPA survey intended to accompany it was not submitted, due to the fact that it had not been started at that time. The mandated survey has not even been undertaken as of this date. It is our understanding from EPA that it submitted to the Office of Management and Budget (OMB) in April of 1987 a partial "survey" of 25 Indian tribes by the Council of Energy Resource Tribes (CERT), which was submitted to EPA on July 19, 1985. This is a "survey" in the nature of an opinion poll of only 25 tribes, done without consultation with the vast majority of tribes, and it does not comply with the directive in P.L. 99-499. OMB maintains that it has not received even this report. We ask this Committee to instruct EPA to conduct the survey of hazardous waste sites on Indian lands in compliance with the law.

The newly reauthorized Clean Water Act also contains tribal-specific provisions. We ask that this Committee be vigilant in ensuring that the one-half of one percent tribal set-aside of construction funds be expended in a timely manner. We also ask that the Committee specifically earmark the one-third of one percent set-aside authorized for tribal nonpoint sources programs under the Clean Water Act. Because the Clean Water Act legislation went into effect in January of 1987, the Administration's FY1988 budget does not contain requests for funds for many of the authorities under the Act.

INDIAN HOUSING

Since the early 1960s, over 50,000 units of Indian housing have been constructed through assistance from HUD and 60,000 units have been rehabilitated through the BIA's Housing Assistance Program (HIP). Currently, 90,240 Indian families living on reservations or trust land need new or rehabilitated housing. In 1970, this figure was 63,000. Health conditions, which improved greatly in the recent past, now are beginning to decline again, leaving Indian people to face increasingly poor health, as well as deteriorating housing conditions.

The Administration's FY1988 HUD budget contains $71,520,853 to fund 1,000 units of new Indian housing. The inclusion of any funds is an improvement over the zero dollars and program terminations proposed for the past several fiscal years. However, this is simply inadequate to meet the documented need. It is only 41% of the 2,459 units assisted in FY1987. NCAI resolutions adopted at our 43rd Annual Convention in September of 1986, call for funding of 6,000 units per year and for an updated HUD/BIA/IHS interagency agreement with regard to Indian housing, water and sanitation facilities.

The FY1988 HUD budget request states that "language is also being proposed for the rescission of any authority during 1988." We oppose this action. In FY1987, language was finally included to reuse recaptured funds in the Indian housing program, and the House and Senate housing authorization bills contain language allowing the reuse of recaptured funds in the Indian housing program. The loss of this mechanism would be detrimental to Indian housing needs. The NCAI membership fully supports the reuse of recaptured Indian housing funds.

SOLAR AND ENERGY CONSERVATION BANK

While we are concerned about the number of federally-subsidized housing units that will be constructed in Indian country, we also are concerned about the costs that Indian families have to pay to keep these houses warm. In recent years, a substantial portion of Indian housing units that have been built have been equipped with electric space heating, apparently because of the low front-end cost, without concern for the high operating costs for this heating option. We believe that HUD should be required to adequately evaluate the operating costs of heating systems used in subsidized housing. We believe that the evaluation of heating systems should include a preference for passive solar design, either as a primary heat source or as a way of reducing the operating costs of any other primary heating system. We note that passive solar design usually can be incorporated into single-family housing at a modest incremental cost of five percent or less, and that these costs usually can cut heating expenses in half. HUD regulations currently permit an increase in prototype cost to accomodate special conditions. This is needed if passive solar design in Indian housing ever is going to become the standard rather than the exception. We believe that passive solar should become the standard.

A HUD program which could be used to help pay for the incremental cost of incorporating passive solar design into new Indian housing is the Solar Energy and Energy Conservation Bank, commonly known as the Solar Bank. The Solar Bank is a federal assistance program administered by HUD. Assistance is provided in the form of loan subsidies for investments in energy conservation and solar for residential, agricultural and commercial buildings. Matching grants also may be provided to very low-income households for energy conservation. The assistance is distributed through state programs, and the NCAI Fund serves as the Indian assistance coordinator. HUD treats the NCAI Fund as a state for purposes of this program. We ask Congress to approve increased appropriations for this Indian assistance and to take appropriate steps to encourage direct-to-tribes funding system for this program.

When the Solar Bank program was created by Congress in 1980, annual appropriations in the range of $1.5 billion were authorized. Actual appropriations have been less than two percent of this amount. There are no unallocated Solar Bank funds, and the Administration requested no money for this program for FY1988. We believe that Congress should increase its level of support for the Solar Bank. We note that Solar Bank assistance is only available for investments that are cost-effective, but that many low-income and moderate-income families cannot afford them, regardless of their cost-effectiveness. In Indian country, there are several thousand federally-subsidized housing units that were built with electric resistance heat as the primary heating system. Solar Bank assistance is an appropriate way to leverage private funds to lower the heating costs for these units through conservation and solar retrofit investments. The NCAI membership at our 43rd Annual Convention formally called for increased funding for the Solar Bank program.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF CAROL WHITE, SCIENCE ADVISOR, NATIONAL DEMOCRATIC POLICY COMMITTEE

Senator PROXMIRE. Our next witness is Ronald Kokinda.

Ms. WHITE. He is not here. I am going to testify in his place.

Senator PROXMIRE. All right.

Ms. WHITE. My name is Carol White, and I am an editor of Fusion magazine, and I am speaking as a science advisor for the National Democratic Policy Committee. What I am speaking on is the NASA budget, which you didn't mention, but I presume that that is on the agenda here.

Last week, the American Institute of Aeronautics and Aviation recommended that NASA's budget be increased by 40 percent and their science budget be doubled. We would think that that was a minimum to allow the United States to have an adequate space program. What I want to do is to put before your attention the urgency of implementing the recommendations of the National Committee on Space which had recommended that within 40 years we have an outpost on Mars, that we begin industrialization of the Moon, and that we put into place an infrastructure of space.

MARS SPACE CITY PROPOSED

What is occurring instead is the whittling away of the NASA program, including the space station, and we consider this to be a disaster for the nation. I would point your attention to the fact that the Japanese have a science city—Sikuba Science City—for fusion power research, and they are going to have a biology science city. We in the NDPC propose that we do a Mars space city, that such a space city could have astronomy as its main target and many questions about the origin of the planet as a subsumed feature of its study. If we don't go for major colonization of space, we will, in fact, not develop the high technology associated with this, and we will fall further behind the Japanese; and then we will have proposals for trade war, which we are simply shooting ourselves in the foot since we will be in a trade war with our allies and destroying the whole of the Western Alliance by disrupting the economic accords which we should have with our allies.

So, what we are proposing to you is, as I say, a doubling of NASA's science budget, 40 percent of the total budget minimally, and a commitment to carry out the program of colonizing Mars. Now, to do this, it is our contention that it cannot be done without major investment also in the fusion budget because, in our view, the only way to have a major colonizing of Mars would be to be able to have space travel there within weeks rather than months.

If you go by ballistic orbit, which is the proposed way of doing it—that with chemical rockets—that is a 6-month trip. We say that this thing could be done; we could realize the potentialities of fusion power by funding our program. We could have fusion propulsion, and we could be traveling to and from the planets within less than a week.

I would like, in my last minute, to just bring to your attention as a note of privilege, perhaps, the fact that the studies that were developed to substantiate our contention on the space colonization if done by the Fusion Energy Foundation, of which I am the editor-in-chief of the magazine Fusion, and we have been closed down summarily by the Justice Department, who put us into forced bankruptcy which, in fact, is a law that doesn't apply to foundations—nonprofit foundations—on the basis of a contention that we had defined a grand jury, which we are appealing in Boston.

And we were given a confiscatory fine of $5 million, although we, in fact, carried out all of the demands of the grand jury, and we are being accused of something we didn't do and all because Lyndon LaRouche is on the board of directors of Fusion magazine. This is the most unheard-of witch hunt of a scientific publication and foundation in the history of this country.

And I hope that, while it is not within the particular purview of Appropriations, that as it is a matter to come before the Senate and as the Justice Department is now being investigated by the Senate, in part the coverups which occurred in relation to contragating the Iran-gate hearings at the moment, that you would take this into consideration.

And we are certainly bringing it to the attention of the Judiciary Committee. Thank you.

DOUBLING OF BUDGET RECOMMENDED

Senator PROXMIRE. Thank you very much, Ms. White. Before you go, I just want to ask you a question. You proposed, as I understand it, doubling the National Science Foundation budget; is that correct?

Ms. WHITE. The science budget; that was the recommendation of the AIAA, that the science budget be doubled and the whole budget be increased by 40 percent.

Senator PROXMIRE. The whole budget be increased by 40 percent?

Ms. WHITE. Right.

Senator PROXMIRE. Now, as I said, we have got to get that money from somewhere. We figure that would be about a $3 billion increase. What do we cut? And we have to cut it out of the rest of the budget that comes before this subcommittee. From a practical standpoint, you have got to come up with a balancing cut.

Ms. WHITE. I can only say that I don't look at it that way because NASA paid back $10 for every $1 invested in the Apollo Program. I will just say quickly that I believe that the Gramm-Rudman is going to have to be dropped, amended, or withdrawn in order to meet the budget this year. I don't think we can stay within those constraints. And, therefore, I would say I don't have a tradeoff. I believe we have got to amend the Gramm-Rudman procedure because I don't believe it is workable. And I think that it is driving this country into technological obsolescence.

Senator PROXMIRE. All right; that means we will have to increase taxes by $3 billion.

Ms. WHITE. I think they would be paid back in revenue. As it is now, we are losing our edge in exports of high technology, and that is documented by us, by the AIAA; and I think we will lose our revenue base if we don't.

ENVIRONMENTAL PROTECTION AGENCY

STATEMENT OF RICHARD WEDEPOHL, PRESIDENT, NORTH AMERICAN LAKE MANAGEMENT SOCIETY

Senator PROXMIRE. Next, we will hear from Richard Wedepohl, president of the North American Lake Management Society. Mr. Wedepohl will talk about EPA's budget and funding for the Clean Lakes Program.

Mr. Wedepohl, you are one of my bosses; I am glad to see you. [Laughter.]

Mr. WEDEPOHL. Thank you, Mr. Chairman.

Mr. Chairman and members of the distinguished subcommittee, as you said, my name is Richard Wedepohl, and I come before you to represent the North American Lake Management Society and our nation's lakes, a forgotten resource.

We have submitted our complete written testimony for your review, and thus I shall be brief.

Mr. Chairman, our message and request is simple and straight forward. We are asking for your support in funding the Clean Lakes Program on the order of $25 to $30 million for the next fiscal year, with no strings attached. When Congress renewed the Clean Water Act this year, they included a strong reauthorization of the Clean Lakes Program. The reason for this, Mr. Chairman, is because the Clean Lakes Program is a very popular and highly effective program. It directly addresses the problems most people perceive as water pollution.

We continue to be mystified by the low level of support this program has historically received from the agencies. The Clean Lakes Program addresses a major threat to the quality of our nation's lakes. This is in contrast to the efforts being made to deal with important problems such as toxics or acid rain, which affect just a handful of lakes. We urge you to give the Clean Lakes Program the support it deserves so that our nation's lakes and reservoirs can get the help they so desperately need.

NONPOINT SOURCE PROGRAMS

We also want to request your support for funding the new Nonpoint Source Program at an initial level of $25 million. Such funds should be equally distributed to the states to help them develop nonpoint source programs.

We also believe this subcommittee should emphasize to EPA that section 319(h)(5) should be implemented by using several demonstration watersheds within each EPA region. We believe it is important to demonstrate the effectiveness of nonpoint source best management practices in a variety of situations across the country so that this subcommittee may have a real basis on which to judge future program appropriations.

Mr. Chairman, the North American Lake Management Society is working closely with many lake association groups to promote and implement watershed management and to enhance and protect our nation's water quality. The Clean Lakes Program continues to play a very effective role in demonstrating to people that clean lakes can be protected and eutrophic, polluted lakes can be restored.

The Nonpoint Source Program is a new initiative and should be given every opportunity to succeed. There really is no substitute for clean water. Our society is dedicated to clean lakes and urges you to appropriate funds so that our national heritage of lakes may be protected and restored.

And I might add, Mr. Chairman, that in the great state of Wisconsin, where our inlands lakes—as you know—comprise over 75 percent of our state's surface water resources, we have greatly appreciated the support you have shown us in the past. Thank you, Mr. Chairman, for this opportunity to testify before this subcommittee.

Senator PROXMIRE. Thank you, sir. And I hesitate to ask you a question that might be construed as unfriendly, and I don't mean it that way—but we have that problem—where is the money coming from? What would you suggest we cut?

Mr. WEDEPOHL. In our opinion, we have made great strides in the past in cleaning up point sources of pollution via the Construction Grants Program and so on to protect and clean our rivers. Perhaps it is time we start shifting gears and moving on into a new area.

Senator PROXMIRE. But the money, you see, has to come from cutting some other part of the budget that comes before this subcommittee. That is the rule. Otherwise, it won't have a chance. You might propose, as the previous witness did, that we just junk the Deficit Reduction Act—it is not going to happen.

From a practical standpoint, if you are going to make an increase—and I am very sympathetic—this is my state—I am all for it, but we have to find the money. For the record, I hope you can think about that; and if you can come up with any area where you think we can make offsetting reductions, it would be very helpful and practical. It would help to advance this proposal you make.

Mr. WEDEPOHL. We will do that.

Senator PROXMIRE. Will you?

Mr. WEDEPOHL. Yes, sir.

Senator PROXMIRE. All right. Thank you.

[The statement follows:]

STATEMENT OF RICHARD E. WEDEPOHL, PRESIDENT, NORTH AMERICAN LAKE MANAGEMENT SOCIETY

Mr. Chairman and Members of the Subcommittee:

My name is Richard E. Wedepohl, and I am president of the North American Lake Management Society (NALMS), a national organization made up of citizens, scientists, lake associations, and water pollution control professionals who are concerned about poor water quality in our Nation's lakes and reservoirs. I am also manager of the State of Wisconsin's lake management program.

For the last six years, NALMS has testified before this Subcommittee in support of funding for EPA's Clean Lakes Program under section 314 of the Clean Water Act and for additional research on the effectiveness and longevity of techniques for restoring and protecting lake quality. We also have stressed the need for funding a national program to control nonpoint pollution. Nonpoint sources are significant contributors to lake pollution. This year we want to stress the need for funding section 314 and the new section 319 nonpoint pollution management program because EPA and State programs are not achieving the needed restoration and protection of lakes and reservoirs. The situation is getting worse.

EPA data show that more lakes are degraded today than in 1972. Over half of all lakes and reservoirs in the Nation are impaired or threatened by water pollution. The health of our Nation's lakes has declined over the last 15 years after passage of PL92-500, because this national problem is not being addressed. EPA has data collected by the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) as part of a 1985-86 nonpoint source survey that shows many times more waters are impaired by nonpoint sources than by municipal sewage treatment plants, yet $2.4 billion annually is being devoted to the construction grants program and pennies are provided for nonpoint source control. This Subcommittee needs to consider where the greatest improvements can be achieved when appropriating funds.

Members of this Subcommittee have pledged in previous years conference reports that once the Clean Water Act was reauthorized, an increased emphasis would be placed on appropriations for section 314 to reverse the degraded condition of our Nation's lakes. Today NALMS is here representing citizens who earnestly desire clean lakes.

Today, NALMS asks you to meet the needs of your constituents for clean water. Congress has amended section 314 to strengthen it and to provide more emphasis on lakes and reservoirs. We ask this Subcommittee to follow through on this commitment by accepting NALMS recommendations summarized below. It is important for Congress to advise EPA to increase, by at least three full-time equivalents (FTE), the Clean Lake Program Staff, which presently amounts to only one FTE staff member. Without adequate, stable funding and direction from this Subcommittee, our lakes will remain degraded and corrective action will become more expensive if delayed into the future.

SUMMARY OF NALMS RECOMMENDATIONS

Section 314: Lakes and Reservoirs

- Level appropriations on the order of $25-30 million should be provided annually for five years for EPA's section 314 Clean Lakes Program to allow States time to develop their own self-supporting lake protection programs. In this context, the Subcommittee should earmark $5 million to states ($100,000/state) under 314c for developing State Lake Restoration/Preservation Programs.
- Section 314 regulations should be reviewed and updated with State input but kept intact to preserve program identity and priority and not combined with other programs, as EPA is proposing. The Conference Report should reflect that EPA be advised to keep section 314 regulations as a separate program. Close coordination with the Nonpoint Source Program should be established to maximize project implementation efficiency and cost-effectiveness.

Section 319: Nonpoint Pollution Control

- The Committee should reflect in the Conference Report that EPA be advised to use section 319(h) (5) PRIORITY FOR EFFECTIVE MECHANISMS to accelerate implementation of nonpoint pollution controls in several demonstration watersheds within each EPA Region so that Congress will have actual water quality effectiveness results upon which to base recommendations for the next reauthorization of the Act. This can be done through a regional, watershed-based demonstration program that would be greatly accelerated compared to the larger section 319 program, which may not yield results in time.
- The Committee should reflect in the Conference Report that EPA be advised to issue regulations regarding the assignment of priorities for both nonpoint source control projects and publicly-owned treatment works for funding under Construction Grants Program (section 201(g)) and under the new Revolving Loan Program (section 603(f)).
- Appropriations of $25 million for FY 1988 should be provided for the section 319 Nonpoint Pollution Management Program. The Committee should reflect in the Conference Report that section 319 funding should first go to State water quality agencies requesting and approved for such funding before disbursement to other State or substrate agencies and, as far as practical, an equal distribution of such funds should be made to the States.

Research

- Full appropriations for water-related research under section 104(u) of the Act are needed to develop and improve assessment methods, predictive tools, and restoration measures for lake and reservoir management.

OUR LAKES ARE BEING LOST

This subcommittee is aware that the lakes and impoundments of this Nation are vital not only for their ecological functions in supporting fish and wildlife but also for the economic basis --

measured in the billions of dollars -- to many local, State and National businesses. Unfortunately, our Nation is losing the battle to keep its lakes clean and the damage may be irreversible, in many cases, because of the high cost of cleanup.

The data EPA has collected from the States with the help of ASIWPCA are clear. Over the last decade, 4 times more lake waters (1.6 million acres) were reported to have degraded in quality than have improved in quality (0.4 million acres). The states also reported over 8 million acres of lakes (over half of all assessed lakes) to be impaired or threatened by nonpoint source pollution -- most of it virtually unregulated. This is an abysmal record and is not responsive to the needs of our citizens. Some states are particularly hard hit. In my State of Wisconsin, over 90 percent of our assessed lakes were reported to be impaired or threatened, most of them by nonpoint source pollution. For the entire Midwest, 80 percent of assessed lakes are impaired. We have a national crisis that still is not being addressed.

EPA PROPOSES LIMITED FUNDING FOR THE CLEAN LAKES PROGRAM

In previous years we described how EPA's Clean Lakes Program under section 314 of the Act focused on implementing lake restoration and lake protection practices rather than just studying problems. Over 87 percent of the total funding has been devoted to implementation, while 7 percent was spent on diagnostic-feasibility surveys. The program is a high-yield, low cost water quality improvement program that has been effective in getting local, State, and Federal interests to cooperate in solving specific water quality problems. Unfortunately, since 1981, continuation of this program has been in jeopardy with budget reductions and efforts to redirect funding for section 314 to other programs. Water quality continues to degrade. The result is that States are not adopting their own programs and, in fact, are closing lake programs down. Florida is a good example of a state with hundreds of degraded lakes that once had a strong program. With mixed signals from Congress and EPA, Florida ended its lakes program; Maine, Wisconsin, and Washington had to struggle to keep their programs. The desperately needed local/State/Federal partnership for restoring and protecting lakes is being lost and the public is not being served.

The seriousness of the problem is recognized by the States but they clearly cannot handle it alone. They need substantial Federal guidance and financial incentives to develop their own programs and convince State legislatures that EPA will assist them in this initiative. This situation is no different from the construction grants program and financing of municipal wastewater treatment. An adequately funded program is needed to permit the States to address such national pollution problems. Section 314 needs this level of funding if States are to develop restoration and protection programs for lakes. NALMS plans to work with States to develop individual State programs. We request the support of this Subcommittee by way of earmarking $5 million for 314c ($100,000 for each State) to develop meaningful Clean Lake Programs.

WHAT IS NEEDED

The degraded condition of our Nation's lakes and reservoirs, especially toxic contamination and potentially irreversible eutrophication problems, has raised public alarm. We recommend that the Appropriations Committee direct in the Conference Report that three additional FTE's be assigned to lake and reservoir management at EPA. Such staff would administer level appropriations on the order of $25-$30 million annually under section 314(c) and serve to facilitate the development and adoption of State lake programs. As mentioned, NALMS requests that an appropriation of $5 million under section 314(c) be provided to States ($100,000 per State) for developing State lake restoration and protection programs. This would be similar to the strategy of using section 106 grants for State development of nonpoint source and groundwater programs the last several years. We feel this initiative is justified because EPA data clearly show that of all types of assessed waterbodies (rivers, estuaries and bays, or lakes), a higher percentage of lake resources are impaired or threatened by water pollution.

NALMS recommends that no less than 5 percent of total appropriations under section 314 be used for EPA staff to administer the program. Grantees are no longer being held accountable for funding provided by the program and barely one full-time FTE is being devoted by EPA to lakes and reservoirs and to managing the more than 200 projects that have not been closed out. This accountability is important but it requires adequate management staff. Furthermore, the Committee Report should direct EPA to keep section 314 as a separate, viable program and not combine it, and the existing regulations, with other programs as has been proposed. This action, being proposed by EPA, would severely impact potential development of State-funded lake/reservoir protection programs.

NONPOINT SOURCES NEED TO BE CONTROLLED

Recent investigations have documented that nonpoint source pollution causes greater amounts of water quality damage in our Nation's waters than do point source discharges (The Nation's Water. Key Unanswered Questions About the Quality of Rivers and Streams. US GAO Sep. 1986 GAO/PEMD-86-6). We supported Congressional efforts to enact the new section 319 nonpoint source program and believe that initial appropriations of $25 million should be provided. However, NALMS believes that the funding should be provided to State water quality agencies first before they are used by other agencies. This could avoid the fragmentation of nonpoint source programs.

Most importantly, however, NALMS strongly urges that the Committee reflect in the Conference Report that EPA be directed to use section 319(h) (5) PRIORITY FOR EFFECTIVE MECHANISMS to accelerate implementation of nonpoint pollution controls in several demonstration watersheds in each EPA Region so that Congress will have actual water quality effectiveness results upon which to base recommendations for the next reauthorization of the Act. This can be done through a regional, watershed-based demonstration program that would be greatly accelerated compared to the larger section 319 program, which may not yield results in time. NALMS members have a good deal of experience in nonpoint control programs, and we know that water quality results do not occur over-night. Congress will likely have no data upon which to judge effectiveness of section 319 unless demonstration projects are picked early -- this year -- to be accelerated so that water quality results can be obtained in time for the next reauthorization. If the Conference Report does not advise EPA to utilize this section of the Act to accelerate regional projects, Congress will likely have little data in 1991 to judge whether the section 319 approach worked.

SUMMARY

Congress is to be commended for its reauthorization of the Clean Water Act. The message it has given to the American people is that clean water is an important part of our heritage and our quality of life and needs to be protected, restored, and maintained.

Americans clearly want and deserve clean lakes and reservoirs for safe drinking water, recreation, industrial use, and aesthetic enjoyment. More than half our Nation's population lives within 5 miles of a publicly owned lake! This Subcommittee can reverse the worsening trend in pollution of our Nation's lakes by targeting funds to keep programs and by providing specific instructions on use of the funding to EPA. NALMS asks this Subcommittee to make a commitment for clean water by supporting our recommendations for funding these key programs. We appreciate the opportunity to testify before you.

STATEMENT OF ROB JOHNSON, ADMINISTRATOR, NATIONAL RURAL WATER ASSOCIATION

SUPPORT SOUGHT FOR NRWA BUDGET

Senator PROXMIRE. We will now take testimony from Rob Johnson, administrator of the National Rural Water Association, who will discuss EPA's Safe Drinking Water Act.

Welcome, Mr. Johnson. Before you begin, I would like to recognize the magnificent job your association has done in providing technical assistance to the tens of thousands of small and rural water suppliers across America. Go right ahead.

Mr. JOHNSON. Thank you, Mr. Chairman. As you said, my name is Rob Johnson. I am the administrator of the National Rural Water Association, and I am here on behalf of our association to thank this committee for their support in the past and request your continued support for our program in EPA's budget for next year. Over the past few years, our testimony before this committee has emphasized three points, and I would like to emphasize those again this year.

The first is that the primary compliance problems with the Safe Drinking Water Act in the United States exists in small systems. The 1986 revisions to the Safe Drinking Water Act were the most dramatic changes since the inception of that act. For example, 86 new contaminants must be in place by 1989 and 25 new contaminants must be in place every 3 years thereafter.

I live on a small system in Loco, OK; we have 83 meters. Estimates from Montgomery Labs out of Los Angeles state that the cost of this sampling for 86 additional contaminants will be $2,600 to $5,500. That means in Loco, OK, each customer per year will pay an additional $31.33 to see that our water is safe, and we consider that important, but that is still a high price to pay.

Also, the act has asked for mandatory filtration in place by 1989. The agency has estimated that 3,000 additional surface water treatment facilities will have to be built.

LEAD CONTAMINATION PROBLEM

The act has specifically mentioned lead as a contaminant to be removed. That leads to an interesting problem. It is one not created generally by the water supply, but one that is created by the customers own plumbing—his own household plumbing.

A recent EPA survey of new homes has found virtually none; they are free of the maximum contaminant level for lead because of lead-based solders, and the agency has taken action and has since outlawed lead-base solders.

The second point we have made is that a very effective method of improving the quality of water in rural areas is through our rural water training and technical assistance program. Over the last 11½ months, we have conducted 480 training sessions with in excess of 17,000 people attending. And we have visited in excess of 7,000 water systems to provide hands-on assistance for their problems.

The third point I would like to make, and the last, is to request that this committee continue providing funding for this program. We would like to extend the program to additional states and we are asking for additional money if that is possible.

We have recently undergone an evaluation by EPA. And the conclusion of that evaluation is that the program offers a very valuable and needed service for helping with compliance, operation, maintenance, and management problems in rural areas.

Again, I would like to thank you for your past support and for the opportunity to present our case to this subcommittee.

Senator PROXMIRE. Now, over the last few years, Mr. Johnson, we funded your organization to ensure your technical assistance is available to the small and rural water system operators. Now, we hear that your task has been expanded quite a bit. Further, the next witness will tell us that the states will not have the resources necessary to meet all federally imposed drinking water requirements, making your job even more important. However, we must find a way to pay for all this.

So, let me ask you the kind of hard question I must ask as we develop the 1988 appropriations bill. The President did not ask for $10 million authorized for drinking water supply technical assistance, but he did ask for $8 million for drinking water wellhead protection grants. Do you see any tradeoff here? To put it another way, would it make sense to shift the funds from the wellhead program into the technical assistance?

Mr. JOHNSON. Yes, Mr. Chairman; we would. The primary source of water for our small systems is ground water, and the primary source of drinking water in Wisconsin is also ground water—underground water. The next witness is Mr. Bob Krill from the Department of Natural Resources and Drinking Water in Wisconsin—I had met with him on Monday.

Our training and technical assistance programs offer the opportunity for these small systems to learn much more about how they can protect their water from the sole-source operative program, the Wellhead Protection Act. We think an investment in our program is a good investment in protecting ground water.

So, specifically, we think money requested for the ground water protection program could be shifted to help this training and technical assistance program.

Senator PROXMIRE. Thank you, sir.

Mr. JOHNSON. Thank you.

[The statement follows:]

STATEMENT OF ROB JOHNSON, ADMINISTRATOR, NATIONAL RURAL WATER ASSOCIATION

Mr. Chairman, my name is Rob Johnson and I am the Administrator of the National Rural Water Association. I am here on behalf of NRWA to thank you and this Committee for the support you have given the rural water training and technical assistance program in the past and to request your continued support for the program in the Environmental Protection Agency FY 1988 budget.

This has been an important year in our rural water training and technical assistance program. We have seen the passage of the strengthened federal safe drinking water act (SDWA), the Congressionally mandated sale of many small FmHA water and sewer system loans, the new emphasis on problems with lead in drinking water, and the first real comprehensive outside evaluation of our program which was requested by this Committee.

Over the past few years we have come to this Committee to request your support for this program. We have emphasized three points. The first is that the primary non-compliance problems under the SDWA are among the small systems in rural areas. The second is that there is a very effective way to improve compliance among these small systems with a peer-oriented grassroots training and technical assistance program. Finally, we have requested that this Committee and the Congress provide funding for the operation of the program. Our testimony this year reemphasizes these same points.

After passage of the federal SDWA in 1974 the entire nature of providing drinking water in rural areas changed. Up to that time practically every small water system was an improvement over poor quality water wells or the daily hauling of water. However, it became clear to small systems that through EPA there would be a national uniform approach to improving the quality of drinking water and water quality would be as important as water supply. During this same period the Farmers Home Administration grant and loan program began to provide new funding for expanding and improving rural water systems. Small water systems increased in all the states. It was at this time that a number of state rural water associations combined together to form a national association for the primary purpose of upgrading the quality of small rural water systems to meet SDWA requirements and improve the quality of water for rural communities. It was clear to rural water systems that the brunt of the effort to meet SDWA standards would be borne by them. This is a prediction that has held true.

Because of testimony from EPA and many rural water systems on small system deficiencies, Congress has been concerned with how small water systems fare under stronger federal drinking water regulations. It was because of this concern that the grassroots training and technical assistance program was initiated. The program was a new concept which allowed rural water folks to initiate and encourage actions that would bring their own systems into compliance with a new federal law. In starting up the program it was difficult at first to gain the cooperation and support of such diverse groups as state health departments, FmHA state offices, EPA regional offices and even many small water systems. There was concern over turf protection and exactly what the role would be for each group. The conclusion reached by all groups was that by operating a grassroots training and technical assistance program that the effectiveness of all agencies involved with rural water was enhanced. The improvement in operation of rural water systems was particularly important in the support given the program by these systems. In short, we believe that through the grassroots training and technical assistance program the sum of the efforts of EPA, states and FmHA has been greater than the whole of its parts.

The success of the program caused EPA to include the program in its annual budget and request it be expanded to additional states. However, in the FY 1982 federal budget OMB cut the entire program out of the EPA portion of the budget without any discussion on the importance of the program to overall SDWA compliance in rural areas. By this time state rural water associations knew that the grassroots approach was very successful; in fact, it seemed to NRWA that the training and technical assistance program was the most successful EPA environmental protection program operating in rural areas. We appealed to this Committee to continue the program and you did. Last year the Committee increased the appropriation for the program which has resulted in a new program being initiated in Wisconsin and three additional states this year.

The program is a solid grassroots program. It is folks working with folks where folks live and work. It is a program that is immediately responsive to resolving rural water system problems in a manner that is compatible with the rural way of doing business. The program provides:

- a variety of training sessions in all rural areas of a state
- a minimum of ten days on-site technical assistance each month
- border-to-border contact with all rural water systems in each state
- monthly or quarterly newsletters with down home advice as well as a very clear message on the priority for SDWA compliance
- immediate assistance for any small system expressing operation or management difficulties by contacting the state rural water association office
- coordinated rural water system efforts within a state to press for increased state and local participation in the funding and support for rural water systems which reduces demand on FmHA grants and loans
- access to all small water systems for EPA and state regulatory personnel to deliver the message and monitor the level of effort for SDWA compliance among rural water systems.

In short, the program delivers a simple, firm message to its peer participants - "rural water systems must take the steps necessary to protect the quality of their drinking water and be in compliance with the SDWA".

The number of participants in the training sessions continues to increase as do the number of rural water systems actively participating in the overall state association program. For example, in the twelve months from April 1, 1986 through March 31, 1987 state associations conducted 480 workshops and provided training for 17,448 rural water operators and other personnel representing 7,985 systems. With the constant turnover of small system operators the majority of these persons have never attended water system training sessions. Over 7,470 technical assistance visits, including visits for serious compliance problems with the Safe Drinking Water Act, were also carried out and were normally the only hands-on assistance provided to these systems to help them meet the requirements of the Safe Drinking Water Act. Attached is a chart outlining state-by-state assistance visits over the past twelve months.

We are meeting with you today at a time when we can see that much has been accomplished in improving the capability of small systems to meet SDWA requirements. However, with the expanded requirements of the new law much more will need to be done. In recognition of this need a new provision was added to the SDWA authorizing up to $10 million for small system technical assistance. This provision finally recognized the importance of small system technical assistance which this Committee has recognized in its present and past commitment to our program. We would urge you and your Committee to consider funding our present rural water training and technical assistance program as part of the new small system technical assistance provision in the new bill. We believe that our program has moved beyond the demonstration phase and that it should be considered as an integral part of the new and expanded EPA program under the Safe Drinking Water Act.

As an example of our work to move quickly to strengthen SDWA compliance NRWA printed and is distributing the first lead in drinking water pamphlet available to any water system big or small. This material is in the hands of the vast majority of rural water systems in our 36 states and training sessions covering the lead problem have been occurring all Spring. Recently, EPA finally decided that all systems must test for lead and that notice must be given to customers. Small rural water systems in these states are already preparing to meet these requirements. There is no substitute for getting clear, concise information to water systems and we believe that our program does it well. This same hands-on help will be available to small systems as EPA issues eighty-five new drinking water standards within the next three years, requires more frequent sampling and reporting by all systems of the EPA-generated contaminant list and confronts systems with the threat of both civil penalties and the increase of costs of about $1300 per system for testing for organic pollutants. These are not easy times for small systems and it is only by working together and helping each other out that so many systems have lived up to their SDWA obligations.

As we have done in the past we are asking you and the Committee to provide funding for our program. You have a new evaluation on our program which explains our efforts at the grassroots level. We have learned from the report and intend to make corrections to shortcomings cited in order to improve the effectiveness of the program even more if given the opportunity. We would like to expand to all of the states because we believe that our program can provide more improved compliance with the new law throughout the country. This would require $3.2 million which may be extremely difficult in this tight budget. We are not pressing for that amount of funding unless the Committee decides that there is a special benefit to SDWA compliance by having a fully national program. We hope that the new $10 million small system technical assistance authorization sets a precedent for this action.

Thank you for your past support and thank you for allowing us to present our case to you today.

MONTH MARCH, 1987

SDWA Y-T-D TRAINING SESSIONS

STATE	NUMBER CONDUCTED	NUMBER ATTENDING	NUMBER SYSTEMS	TOTAL CREDITS	TOTAL TNG HOURS	REGIONAL EPA	OPER/MGR	STATE REGULAT	DECISION MAKER	FmHA	ADMIN	INDUSTRY	PUBLIC	INFORMATION SEMINAR	TRAINING COURSE	PROBLEM SOLVING	JOINT SPONSOR	HOME STUDY
Alabama	23	802	294	135.25	636.25	0	238	6	294	7	116	59	82	12	3	2	0	0
Arkansas	14	551	267	109.25	524.75	18	326	10	65	11	18	85	16	7	3	0	0	0
Colorado	31	766	425	130.75	647.75	1	478	41	110	4	84	43	12	29	0	0	0	0
Florida	18	381	198	100.00	597.75	1	227	45	63	1	26	26	4	12	0	2	2	0
Georgia	13	685	272	110.00	787.00	0	331	6	131	8	41	138	25	4	5	1	1	0
Illinois	12	240	153	88.75	497.25	5	172	14	33	3	2	21	0	7	1	0	2	0
Indiana	15	541	208	106.25	442.00	0	177	24	130	19	48	52	97	8	4	0	0	0
Iowa	14	596	346	120.00	588.00	0	327	6	58	26	137	35	5	6	3	0	0	0
Kansas	15	1803	457	140.50	1180.75	18	654	63	314	22	142	365	224	5	5	1	0	0
Kentucky	16	746	280	125.50	512.00	0	436	20	110	14	22	100	37	7	6	1	0	0
Louisiana	12	635	544	96.75	537.00	0	529	17	30	6	4	48	2	6	0	0	3	0
Maine	15	463	284	68.00	529.00	2	323	22	17	1	51	32	10	7	0	0	0	0
Minnesota	11	413	171	97.50	620.50	0	198	3	27	2	10	96	77	5	3	0	0	0
Mississippi	22	804	357	95.00	712.00	0	325	37	201	6	37	182	16	19	0	1	0	0
Missouri	11	595	207	91.50	546.00	1	291	6	75	12	27	135	48	4	4	1	0	0
Montana	17	590	305	153.00	627.50	1	330	27	118	2	54	43	16	8	1	1	3	0
Nebraska	14	559	308	105.75	964.75	0	369	31	20	14	7	82	40	6	4	0	0	0
New Mexico	13	318	154	95.75	740.00	0	109	16	115	7	6	48	18	8	0	0	3	0
New York	15	673	360	95.75	328.50	2	563	21	23	0	7	37	7	8	3	2	0	0
North Carolina	16	677	266	100.50	618.75	0	447	23	25	4	17	145	12	8	2	2	0	0
North Dakota	31	435	152	102.75	649.00	0	297	11	317	0	14	30	11	16	1	0	1	0
Ohio	6	151	58	34.25	227.00	1	66	3	38	3	14	18	6	3	1	2	0	0
Oklahoma	14	625	383	112.75	570.00	4	187	18	207	36	97	31	45	5	5	0	0	0
Oregon	13	247	135	83.00	535.50	0	120	16	36	10	32	29	1	7	0	1	0	0
South Carolina	15	368	169	130.75	597.50	2	210	22	77	2	24	14	14	7	4	0	0	0
South Dakota	11	512	152	95.00	700.50	0	150	23	204	1	32	59	43	6	1	2	0	0
Tennessee	9	504	285	59.50	842.75	0	298	22	90	0	60	12	22	7	0	0	0	0
Texas	15	621	238	103.00	459.00	43	245	16	119	22	53	67	14	11	0	0	0	0
Utah	15	395	187	117.75	630.25	1	335	17	17	0	3	20	2	4	1	2	3	0
Vermont	19	361	229	162.00	1199.50	0	159	3	23	10	3	24	1	5	2	3	13	0
West Virginia	15	391	141	97.00	505.00	1	226	16	66	10	12	54	4	7	2	3	0	0
TOTAL	480	17448	7985	3263.5	19553.5	101	9143	605	3153	263	1200	2130	911	254	64	27	31	0

APRIL 19, 1986 THROUGH MARCH 31, 1987

MONTH MARCH, 1987

TECHNICAL ASSISTANCE YEAR-TO-DATE TOTALS

STATE	SYSTEM CONTACT	TA HOUR	TA CONTACT HOURS	NUMBER OF REQUESTS	NO. OF REQ. BY SYS.	REGULAT AGENCY	OTHER	COMPL	POTENTL COMPL	OPER.	MGT/FIN	FURNISH INFO	SOLVED	INSTRUCTED	UNKNOWN	ADMIN. TIME	OTHER TIME
Alabama	215	521.75	397.25	38	19	2	16	0	33	166	9	174	23	4	9	229.50	190.50
Arkansas	393	513.50	701.50	136	132	0	18	0	2	149	241	291	53	1	48	122.00	314.50
Colorado	236	643.25	275.25	135	131	1	3	9	3	104	120	155	54	14	13	469.25	279.50
Florida	246	763.00	282.25	47	46	1	0	21	38	129	58	157	30	16	43	141.25	230.50
Georgia	121	588.25	284.00	102	74	3	33	1	28	98	43	121	49	63	3	39.50	129.50
Illinois	261	466.50	288.00	73	72	1	0	0	0	238	19	216	39	0	0	297.75	405.25
Indiana	321	613.75	636.50	42	48	0	65	3	0	297	21	281	12	24	4	163.75	203.00
Iowa	254	800.50	362.50	153	136	6	11	0	12	123	106	32	132	80	10	144.50	199.00
Kansas	165	843.75	299.00	136	125	6	5	21	19	51	69	119	31	10	0	285.00	181.75
Kentucky	131	635.25	372.00	86	92	1	1	28	10	54	47	91	46	5	2	404.50	310.50
Louisiana	193	445.75	483.00	152	219	2	29	3	23	96	69	125	65	0	2	491.50	59.00
Maine	235	779.75	386.00	138	113	16	38	37	11	49	124	150	144	4	2	158.00	324.00
Minnesota	219	629.50	379.75	107	105	0	2	2	4	158	55	107	30	82	0	347.25	317.75
Mississippi	603	772.25	760.00	45	41	0	4	8	1	477	116	587	14	2	0	59.75	81.00
Missouri	248	583.00	299.50	172	165	6	1	8	35	90	118	101	89	56	5	247.00	405.25
Montana	251	624.50	439.50	180	136	30	5	61	18	84	88	185	62	0	4	426.50	179.50
Nebraska	329	489.75	334.50	250	246	3	13	68	81	132	41	246	62	8	5	309.00	97.00
New Mexico	216	596.50	460.50	146	142	2	2	10	5	89	93	115	79	10	1	267.50	168.00
New York	111	318.50	441.00	83	100	9	0	1	1	71	37	16	85	8	2	489.00	384.00
North Carolin	105	573.50	345.00	64	66	0	0	0	14	71	20	44	28	32	1	226.00	304.00
North Dakota	262	576.50	422.00	132	124	1	3	1	2	189	68	122	6	3	126	345.00	338.75
Ohio	194	508.00	290.00	68	63	0	5	7	26	124	38	117	62	0	15	112.00	110.00
Oklahoma	204	610.00	254.25	53	51	1	15	18	1	113	86	40	144	3	16	465.50	292.50
Oregon	367	626.50	326.75	45	45	0	0	113	7	83	162	264	47	14	37	185.00	288.00
South Carolin	361	439.00	555.50	240	161	68	15	30	79	174	83	169	122	67	1	498.50	306.25
South Dakota	189	703.75	311.25	74	67	5	2	14	36	89	50	98	35	33	23	165.25	145.00
Tennessee	165	435.95	237.25	58	51	0	44	21	18	41	73	108	25	3	0	386.00	153.00
Texas	94	480.25	245.00	38	52	2	2	10	17	8	51	70	22	0	0	287.00	281.75
Utah	254	652.50	484.25	166	144	22	0	13	19	126	100	92	92	42	32	181.50	279.75
Vermont	319	1834.00	1084.75	253	238	1	15	49	3	253	14	260	47	12	0	4.00	24.50
West Virginia	208	666.50	271.50	67	54	6	8	6	3	137	51	183	17	6	2	318.00	208.00
TOTAL	7470	19735.45	12709.5	3479	3258	195	335	563	549	4063	2270	4836	1746	602	406	8266.25	7191

TOTALS FOR APRIL 19, 1986 THROUGH MARCH 31, 1987

STATEMENT OF ROBERT KRILL, P.E., BOARD OF DIRECTORS, ASSOCIATION OF STATE DRINKING WATER ADMINISTRATORS

PROTECTION OF PUBLIC HEALTH

Senator PROXMIRE. Our next witness is Robert Krill. Mr. Krill is a member of the board of directors of the Association of State Drinking Water Administrators, and he will be commenting on federal assistance to state public water supply supervision programs under EPA.

Now, you look as though you must be a Badger also; is that correct?

Mr. KRILL. That is correct.

Senator PROXMIRE. Also from Wisconsin?

Mr. KRILL. Also from Wisconsin.

I am director of water supply—I used to be in solid waste management—in the state of Wisconsin, and I am representing the Association of State Drinking Water Administrators here this morning. We would like to thank you for this opportunity to present this testimony.

As the professional organization which represents state drinking water regulatory agencies at the national level, ASDWA—that is the acronym—its primary mission is the protection of public health through effective and efficient implementation of the Safe Drinking Water Act. To this end, the association has been providing communication, coordination, and information transfer services between state programs and EPA, the Congress and other national organizations since its inception.

Our current formal membership stands at 32 states, and we expect to have at least 35 states as dues-paying members by the end of this year. To date, 46 of the 57 states and territories have indicated their support for our association and have actively participated in various activities.

In keeping with one of our primary purposes, that of providing state primacy agents a collective voice on issues of importance in national drinking water policy, we present this testimony on behalf of the states.

Senator, last year the Congress passed a major piece of legislation, the Safe Drinking Water Act Amendments of 1986. That legislation imposed major new responsibilities on states who are charged with managing the implementation of the act.

ASDWA recently completed a survey of state program managers to quantify the resource needs for implementing the act. At the time of the survey, only regulations concerning volatile organic chemicals and mandatory filtration of surface supplies were mature enough to allow accurate estimates. Based on these two provisions alone, the states estimate an additional $20.8 million per year for the next 5 years will be required to adequately regulate community water systems.

In addition, EPA is proposing to include approximately 20,000 nontransient, noncommunity water systems under the community regulations. Our estimate is that this will require an additional $9 to $12 million per year for the next 5 years for adequate state regulation.

As I mentioned, this approximately $30 million per year of additional need only considers some of the requirements imposed by the Safe Drinking Water Act. It does not, for example, consider other significant program activities such as the ban on lead-forming materials, public notification requirements, monitoring for unregulated contaminants, and regulations concerning radionuclides, disinfection byproducts, and other contaminants that will be forthcoming.

SAFE DRINKING WATER HIGH NATIONAL PRIORITY

The states are not going to be able to obtain any significant funding increases from state legislatures. The federal government, by passage of the act, committed to the citizens of this country that the provision of safe drinking water is of the highest national priority.

We, therefore, urge the subcommittee to appropriate the full $37.2 million authorized for public water supply supervision grants for fiscal year 1988. In addition, we believe the full $10 million authorized for technical assistance should also be appropriated. We thank you for this opportunity to present our comments this morning, and I would be happy to answer any questions that you might have.

Senator PROXMIRE. Thank you. Mr. Krill, you have called for additional spending, as I understand it, additional support for the safe drinking water supervision programs among others.

PUBLIC WATER SUPPLY SUPERVISION PROGRAM

How would you compare, for example, the public health benefits of the Public Water Supply Supervision Program with those that might accrue from the proposed Wellhead Protection Program that has yet to be initiated?

Mr. KRILL. All right. EPA has recently published some information that indicates that approximately 1,000 cancer cases are caused or may be caused on an annual basis by contaminated drinking water. This estimate was based on some rather incomplete information and is likely to rise as more complete studies are done on the various contaminants that are required to be regulated under the act. On the other hand, on the Wellhead Protection Program, I was recently involved with EPA on the Management Practices Committee which was assisting them in the preparation of some guidance for the Wellhead Protection Program. This program, if it is fully implemented, certainly would be a valuable asset, but there is little information at this point in time to determine just exactly what public health benefits might be attributed to the program.

I believe it would be the concensus of our association membership that there is more good to be gotten—more bang for the buck, so to speak—out of funding the Public Water Supply Supervision Program than the Wellhead Protection Program.

Senator PROXMIRE. All right. One other question. How much of an increase are you recommending over the budget? Can you tell us?

Mr. KRILL. I understand the current authorized level would result in a $3.75 million increase over that which the administration has requested.

Senator PROXMIRE. $3.75 million?

Mr. KRILL. $3.75 million for the Public Water Supply Supervision Program.

Senator PROXMIRE. That is a modest increase, $3.75 million, and I hope that you can help us to find the offset for it.

I would say, as thirsty as I am, I don't know if I should drink this water after that testimony. [Laughter.]

Mr. KRILL. You will have to find out how it has been tested and what might be in it.

[The statement follows:]

STATEMENT OF ROBERT KRILL, P.E., BOARD OF DIRECTORS, ASSOCIATION OF STATE DRINKING WATER ADMINISTRATORS

I. INTRODUCTION

The Association of State Drinking Water Administrators (ASDWA) wishes to express its appreciation to the Subcommittee for the opportunity to present this testimony. As the professional organization which represents State Drinking Water Regulatory Agencies at the national level, ASDWA's primary mission is the protection of public health through effective and efficient management of state water supply programs and implementation of the Safe Drinking Water Act Amendments (SDWA). To this end, the Association has been providing vital communication, coordination, and information transfer services between the state programs and EPA, the Congress, and other national organizations since its inception in 1984. Our current formal membership stands at 32 states; it is expected that at least 35 states will be dues-paying members of the Association by the end of this year. To date, 46 of 57 states and territories have indicated their support for the Association and have participated actively in various ASDWA activities.

Within the past two years ASDWA has accomplished a number of important activities on behalf of the state primacy programs. These include an in-depth study of the extent and performance of treatment currently provided by community water systems. This research is being used by EPA as the basis for many decisions related to the surface water treatment rule, currently under development by the Agency. In addition, a national workshop on lead in drinking water, sponsored in conjunction with EPA, was held earlier this year. The results of this workshop will be used by the states and EPA as the basis for development of a national strategy to mitigate lead contamination problems. Finally, ASDWA has sponsored two annual conferences which have become important forums for the exchange of perspectives on drinking water and groundwater issues. Representatives of nearly 40 states, EPA headquarters and regional personnel, water utilities, and professional associations attend the ASDWA Annual Conference.

In keeping with one of our primary purposes -- that of providing state primacy agents a collective voice on issues of importance to national drinking water regulatory policy -- ASDWA presents this testimony on behalf of the states; the Association's testimony reflects the general consensus of the state drinking water program administrators.

The relationship between drinking water quality and other environmental protection programs has become increasingly apparent in recent years. Although hazardous waste and toxic substances may receive greater media attention than drinking water, it is recognized that a primary goal of remediation at waste disposal sites and of limitations on pollutant discharges is to avert or mitigate contamination of drinking water sources. The establishment, implementation and enforcement of drinking water standards will facilitate the development of a definition of "how clean is clean" for use in specifying remedial standards and effluent guidelines. State drinking water primacy agencies will have the central role in ensuring that the standards and requirements mandated under the SDWA Amendments become fully entrenched as the law of the land.

Despite the importance of safe drinking water to human health and the recognition of the crucial role the state primacy agents play in properly implementing the national program, the programmatic responsibilities of state drinking water agencies have traditionally far exceeded their operating budgets. As a result, all crucial program elements cannot be fully accomplished and in some cases, public health protection has been compromised. Since 1974, the number of reported waterborne disease outbreaks attributed to public water supplies has increased significantly. Nearly half of these outbreaks resulted from glaring deficiencies in disinfection practices. Between 1963 and 1982, at least 496 outbreaks of waterborne disease occurred in public water systems (see Figure 1). This indicates that there is still significant work which needs to be done to address even the most basic public health problems associated with water supply.

Unless adequate resources are made available to state programs, the new regulatory mandates embodied in the SDWA Amendments will only serve to exacerbate this situation. The new Amendments pose a tremendous workload for state programs. Moreover, because of the large number of new contaminants being regulated and the unique mechanisms involved in implementing some of the provisions, the Amendments will essentially revolutionize the drinking water program function at the state level.

Through this testimony, we wish to convey the urgent and unanimous conviction of state drinking water program administrators that their ability to effectively carry out increasing statutory and regulatory responsibilities will depend directly on the levels of budgetary resources available to them. It is ASDWA's strong belief that, in order to adequately meet these increasing responsibilities, the FY-88 appropriation for public water system supervision (PWSS) grants should be increased to the full authorization level of $37.2 million, and that the $10 million authorized (under section 1442(g) of the SDWA Amendments) for technical assistance to small water systems also be appropriated. These added funds, and corresponding increases in the states' share of PWSS program budgets, will enable state primacy agencies to continue to protect public health by ensuring the safety of the nation's public water supplies.

II. HISTORICAL TRENDS IN FEDERAL SUPPORT FOR PWSS PROGRAM

Figure 2[1] illustrates the overall trend in federal support for state drinking water programs through PWSS grants. Based on a sample of 25 states, Figure 2 indicates that while the total operating budget for these state programs has increased slightly in real dollars since 1976, the percentage of the total budget from PWSS grants has fluctuated. In 1976, the Federal portion of state drinking water program budgets amounted to less than 32 percent, by 1981 it had increased to almost half (47.7 percent), and in 1986 it had again fallen to less than one-third (30.9 percent).

Until FY-87, appropriations for PWSS grants had either decreased or remained static in real dollars every year since 1980. During this same time frame, EPA steadily increased the number and complexity of administrative requirements for state programs. This included expanded record keeping, reporting, and data management requirements, additional and more comprehensive sanitary surveys, and other activities. In addition, when contamination incidents associated with hazardous waste disposal and Superfund investigations affect public water supplies, direct impacts on state PWSS programs often result.

It is imperative that the trend of reduced Federal support be reversed if the Congressional intent of the SDWA is to be realized. The legislative history of the SDWA clearly illustrates Congress' interest in expanding the scope and stringency of the Act to improve public health protection. ASDWA shares these goals and agrees that changes in the law such as mandatory filtration of all surface supplies and disinfection of all systems are justified. Implicit in the statutory requirements for the Administrator to "promulgate regulations" for these and other requirements, however, must be the understanding that it will be the state primacy agents who will be "in the trenches" actually doing the work involved with implementation and enforcement. ASDWA strongly believes that since the trend in Federal requirements for regulation of public water supplies is increasing, so too must the trend in Federal support for state programs.

III. ESTIMATED RESOURCE SHORTFALLS OF STATE PROGRAMS

ASDWA recently completed an internally funded survey[2] of state program administrators to ascertain and quantify resource needs for implementation of certain provisions of the SDWA Amendments over the next several years. When the survey was initiated, only regulations pertaining to volatile organic chemicals (VOCs) and mandatory filtration of surface supplies had progressed sufficiently to allow for reasonably accurate estimates. Based on these two provisions alone, the states estimate that an additional $20.8 million per year will be required from all sources to adequately implement PWSS regulations in community water systems during the five year period FY-87 and FY-91 (see Tables 1 - 3).

EPA is now proposing to include certain types of "non-transient" non-community water systems as part of all new regulations which are promulgated. The Agency estimates that there are approximately 20,000 of these systems nationwide. The inclusion of these systems would increase the "universe" of public water supplies which are actively monitored and supervised by the primacy agencies by almost 34 percent and would dramatically amplify the resource shortfalls for the programs mentioned above. While the ASDWA survey did not include non-community systems, a rough estimate of additional resource needs for implementation of the proposed filtration and VOC rules in these water systems ranges from $9 - 12 million per year between FY-87 and FY-91.

It must be emphasized that these estimates reflect needs for only a portion of the funds which will be required to fully implement all aspects of the SDWA Amendments. Among the other regulations being developed which could significantly affect the resource needs of state programs in FY-88 are those pertaining to the ban on lead plumbing materials, public notification requirements, and monitoring for unregulated contaminants. In addition, the Agency has recently issued draft operating guidance for FY-88 which places heavy emphasis on enforcement through the issuance of administrative orders and other activities. These program elements, while necessary, tend to be labor intensive. To be accomplished effectively they will require a diversion of manpower from other activities in many states unless adequate funding can be obtained to hire additional qualified personnel.

In addition to the regulations which will take effect in the short term, regulations for contaminants in Phases III - V are to be promulgated by the Agency over the next several years. Included in these regulations will be provisions for mandatory disinfection of all public water supplies as well as control of chemical by-products of disinfection processes. As with other SDWA regulations, these will require an expanded commitment of resources on the part of state programs for proper implementation. However, by setting a trend towards adequate operating budgets now, state programs may be able to establish the human capital necessary to more readily assimilate these added future regulatory responsibilities.

In testimony before this Subcommittee last year, Mr. Gayle Smith, Drinking Water Program Administrator in Utah and ASDWA Past President, estimated that state programs will require additional resources of at least $44 - $60 million per year from all sources "...to begin full implementation of the [SDWA] requirements." Based on the results of the ASDWA Resource Needs Survey, this may be a conservative estimate.

IV. CONCLUSION

The imminent increase in workload and expanded regulatory requirements coupled with a continued scarcity of resources will force most state drinking water programs to further curtail program elements crucial to protecting the public health. The vast majority of attention will be paid to contaminants and programs which receive the most visibility; VOCs, pesticides, and lead will likely take precedence over other activities. While acknowledging the importance of these contaminants, it must be stressed that many public water systems are still confronted with deficiencies in even the most basic public health concerns, such as protection from bacterial contamination. Aggressive implementation of the full range of regulations embodied in the SDWA Amendments will simply not be possible unless resources available to the state programs are expanded significantly; while the statute and regulations will be "on the books," primacy agents will lack the capability to translate them into workable programs at the state and local level.

The states have long advocated a preventive approach to supervision of public water systems. As alluded to above however, preventive practices, such as technical assistance, operator training, sanitary surveys, and administrative oversight will probably be the first activities to be curtailed when resources are scarce, especially at small community water systems and non-community water systems. Ironically, these are the systems that require the most attention since they account for the vast majority of reporting and standard violations. In a recent report, the National Council on Public Works Improvement found that "many small water systems, as currently managed and operated, constitute a significant threat to public health."[3] The NCPWI report further stated that this was due in part to a lack of technical expertise of system operators.

Reduction in technical assistance and other proactive measures inevitably leads to a self-perpetuating "downward spiral" by water systems relative to compliance with drinking water regulations. When preventive measures by the state primacy agencies are decreased, the number of violations by water systems increases. This leads to the need for more compliance and enforcement actions by the states, activities which further divert resources and manpower from technical assistance, sanitary surveys, and operator training.

The Federal government, through the SDWA Amendments and through expanded EPA regulations has clearly indicated that ensuring the continued provision of safe drinking water is of the highest national priority. ASDWA shares this view and is committed to this goal. To mitigate the need to eliminate vital state program elements and the resulting risks to public health, we urge the subcommittee to appropriate the full $37.2 million authorized for PWSS grants under the Act for FY-88. Further, to help reduce the magnitude of the special problems associated with small systems, ASDWA requests that the full $10 million authorized for technical assistance also be appropriated.

The Association of State Drinking Water Administrators greatly appreciates the opportunity to provide this testimony to the Subcommittee.

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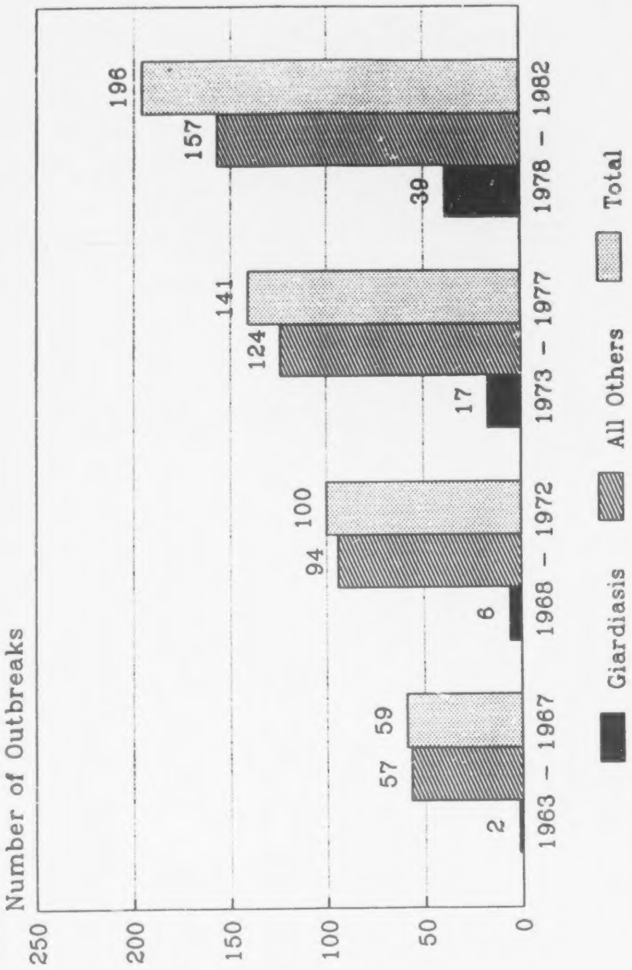
[1] Source: A Survey of Resource Needs of State Drinking Water Programs. Association of State Drinking Water Administrators, April, 1987 draft.

[2] op. cit.

[3] Wade Miller Associates, Inc. 1987. Infrastructure Policy Issues in Water Supply for The National Council on Public Works Improvement, Washington, D.C. p. IX-8.

FIGURE 1

WATERBORNE DISEASES
In Public Water Supplies

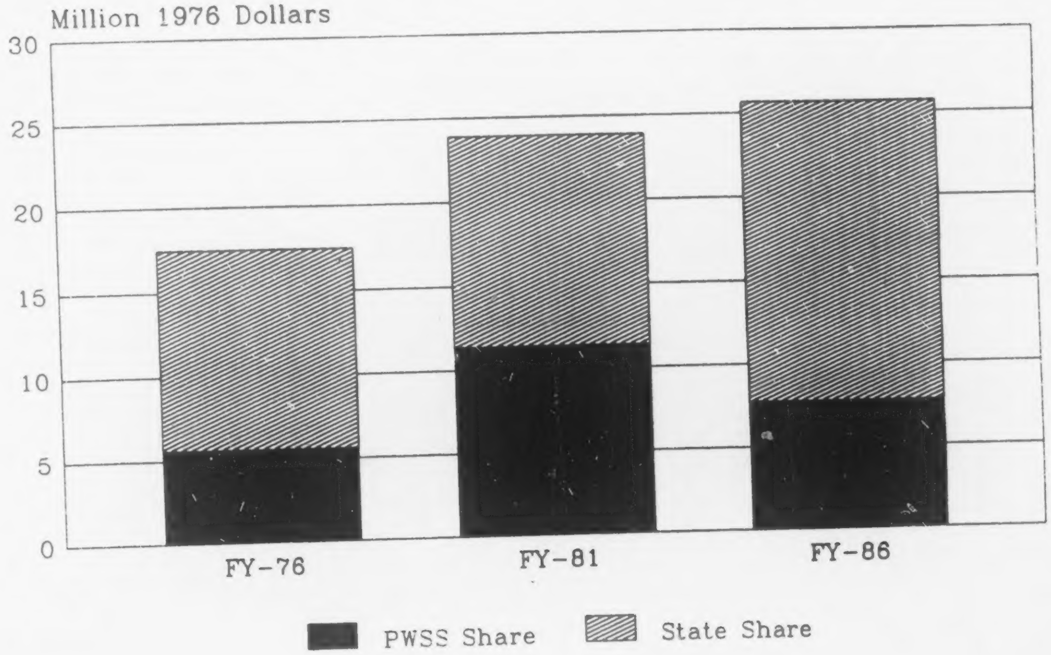


Source: Logsdon, G.S. and E.C. Lippy. 1984. Environmental Engineering. Proc. of the 1984 Specialty Conference.

FIGURE 2

TOTAL OPERATING BUDGET

State vs. PWSS Share



Data for 25 States

TABLE 1. RESOURCE NEEDS OF STATE DRINKING WATER PROGRAMS TO IMPLEMENT BOTH VOC AND FILTRATION REGULATIONS, FY-1987 TO FY-1991.

	ADDITIONAL ANNUAL BUDGET NEEDS*	ADDITIONAL TOTAL BUDGET NEEDS*	ADDITIONAL TOTAL STAFFING NEEDS**
TOTAL	$20,823,177	$103,837,885	493.1
STATE AVERAGE	$408,295	$2,036,037	9.6

TABLE 2. RESOURCE NEEDS OF STATE DRINKING WATER PROGRAMS TO IMPLEMENT VOLATILE ORGANIC CHEMICAL REGULATIONS, FY-1987 TO FY-1991

	ADDITIONAL ANNUAL BUDGET NEEDS*	ADDITIONAL TOTAL BUDGET NEEDS*	ADDITIONAL TOTAL STAFFING NEEDS**
TOTAL	$13,936,097	$69,400,485	292.6
STATE AVERAGE	$273,257	$1,360,794	5.7

TABLE 3. RESOURCE NEEDS OF STATE DRINKING WATER PROGRAMS TO IMPLEMENT SURFACE WATER FILTRATION REGULATIONS, FY-1987 TO FY-1991.

	ADDITIONAL ANNUAL BUDGET NEEDS*	ADDITIONAL TOTAL BUDGET NEEDS*	ADDITIONAL TOTAL STAFFING NEEDS**
TOTAL	$6,887,080	$34,437,400	200.5
STATE AVERAGE	$135,041	$675,243	3.9

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* - In FY-1986 dollars.

** - Number of full time equivalent employees including clerical.

JOINT STATEMENT OF:

JON BRADY, HAMILTON COUNTY PARK DISTRICT, CINCINNATI, OHIO

ROBERT MASON, OHIO LAKES MANAGEMENT SOCIETY

STATEMENT OF JON BRADY

Senator PROXMIRE. Our next witnesses are Jon Brady of the Hamilton County Park District in Cincinnati, Ohio, and Robert Mason of Ohio Lakes Management Society.

They will discuss the budget for EPA's Clean Water Act.

Gentlemen, we are happy to have you here. Go right ahead.

Mr. BRADY. Thank you, Mr. Chairman. I am the director of the Hamilton County Park District. Appearing with me today also is Robert Mason, who is our environmental specialist. His responsibilities are to preserve and protect the water quality of the park district's four major lakes, its numerous ponds, streams, and water resources. Mr. Mason is also president-elect of the Ohio Lakes Management Society.

Our purpose here today is to urge your recommendation for full funding of the Clean Lakes Program contained within the Clean Water Act of 1987. As a local park and recreation agency rather than a national organization, we believe we might be able to shed some light on the critical needs and also the benefits of the Clean Lakes Program and what they can bring to local communities.

BACKGROUND

In the way of background, our park district is comprised of 16 parks and nature preserves with almost 10,000 acres in the densely populated greater Cincinnati area of southwestern Ohio. Our four lakes play major roles in the area of flood control, water base recreation, boating, fishing, wildlife, and other natural resources and environmental health in Hamilton County. Two of these lakes have suffered severe degradation from both point source and nonpoint source pollution and through sedimentation. Both lakes have lost over half their volume through this sedimentation.

I am proud to say that one of the lakes is currently undergoing total restoration through major improvements in the watershed and a massive dredging project. This restoration totals $2.5 million for the dredging alone and is being funded with both park district and state funds. Unfortunately, improvements to our second lake are estimated at $10 million for the dredging and more control and emphasis must be given to watershed management.

The Clean Lakes Program could play a key role in this phase of the project. Fortunately, the watersheds of our remaining two lakes are almost completely owned by the park district and we are able to properly control erosion and pollution. Even here, 10 percent of the watershed of one lake is privately owned and adequate controls are needed to prevent or at least minimize pollution and degradation in water quality.

Through education and media exposure, our community is now aware of the hazards, deterioration, and loss of both natural and recreational resources through pollution and sedimentation.

With community and public support, we are attempting to restore and protect our lakes and to prevent their loss in the future. We ask Congress to assist our local and state efforts to protect our invaluable water resources, our nation's lakes.

Please give your full support to the Clean Lakes Program. Bob?

STATEMENT OF ROBERT MASON

Mr. MASON. On behalf of the Ohio Lakes Management Society, I send you greetings and thank you for the opportunity to speak today. In the state of Ohio, we have 212 publicly owned lakes and an additional 2,084 privately owned lakes with surface areas of 5 acres or more. Although this doesn't come near the grand 14,000 that Wisconsin has, with our population of over 9 million people, the lakes we have become very precious to us.

Of those lakes, however, 86 percent of them are considered eutrophic. The vast majority of Ohio's lakes would not be eligible for funding under chapter 314 of the Clean Lakes Act, but our experience has been that through a meaningful Clean Lakes Program, they would all benefit through the knowledge gained and the management techniques developed.

With that in mind, the Ohio Lakes Management Society requests that section 314 of the Clean Water Act be funded at or near the authorized levels of the Act of 1987, which would be $25 to $30 million per year for 5 years, and that the EPA create an office of lake and resource protection to administer the 314 moneys and to facilitate the states in developing their own lake programs which would eventually become independent. We propose an annual appropriation to section 314(c) of $5 million to help carry out the creation of state projects which would then become funded on their own at some future date.

Much attention has been given in the past to point source pollution and many strides have been made, but we are only now coming to grips with the nonpoint source issue. With that in mind, the Ohio Lakes Management Society requests that section 319 be funded at a level of $70 million, which is the authorized level for fiscal year 1988, and that the EPA be directed to set up the administration projects under 319(h)(5) to quickly obtain additional data on the projects to help assess any future appropriation needs.

I thank you for your attention.

Senator PROXMIRE. Mr. Brady, let me ask the question I have asked other witnesses a little differently with you. How do we deal with the problems more efficiently and in a more cost-efficient manner? How can we do this at less cost? What advice do you have on how better to run the Clean Lakes Program and how we can better target the resources we have?

Mr. BRADY. I think part of the problem is in education. We certainly in our own community have thousands of people —and Bob can testify to this—who simply don't know how their waste is being treated. When we alert them of the fact that they have their own separate system or that more controls are necessary, we have found that we receive compliance. We are not in a position to regulate these particular issues, but we find that just simple cooperation and compliance can come just from educating the community.

There are no EPA regulations which are strong enough nor does EPA come in and regulate a number of these particular problems.

Senator PROXMIRE. Stronger EPA regulations would reduce the cost of cleanup, I take it?

Mr. BRADY. Of cleanup, certainly. If I might point out, we have our own situation where we have a number of multijurisdictions within two counties, several cities, and townships, and we were able to put together a task force. We started with absolutely no money and simply convinced the community and also the state legislature how important these projects are and to provide funding for them. And we were able to cost-share that particular program.

We are currently working on one lake with conventional earthmoving equipment to remove sediment which has decreased the total cost—rather than hydraulic dredging—by about 15 percent, and that is a cost savings. Of course, this is after the fact. This is after 50 years of the lake being in degradation. Had adequate controls—and we are simply talking about regulations and controls—been in place, much of this would have been prevented; and we wouldn't be spending $2.5 million currently, had their been adequate regulations within the watershed.

In another particular lake that we have, we have 28 square miles of watershed, and we are in about 12 different jurisdictions. Again, we have formed a task force—this is an ad hoc group—to begin to regulate and to control these. However, there is some need for additional funding, or at least some evidence of support on the national level.

Senator PROXMIRE. Thank you very much. Those are very helpful remarks. I appreciate that.

[The statement follows:]

STATEMENTS OF HAMILTON COUNTY (OHIO) PARK DISTRICT AND OHIO LAKE MANAGEMENT SOCIETY

SUMMARY

The Hamilton County Park District is a local park and recreation agency located in the Cincinnati-Southwestern area of Ohio. The District's primary functions are preservation of natural resources and outdoor recreation in our sixteen parks and nature preserves, totalling over 9600 acres. Of the Park District's four major lakes, two have been severely polluted and more than half the volume of each has been lost to sedimentation from sources outside our boundaries and jurisdiction. The remaining two lakes are essentially pollution free since the Park District controls the entire watershed of one and 90% of the other watershed. This dichotomy effectively demonstrates that lakes, ponds and impoundments can exist and remain pollution free under proper controls and regulations. The only national agency which can effectively regulate multi-jurisdictional sources of pollution and provide and promote Clean Lakes on a national basis is the U.S.E.P.A. and specifically, the Clean Lakes Program.

H.R.1 - The Clean Water Act and the Clean Lakes Program (section 314) have not been adequately funded in the past. While productive with the limited resources available, the Program has not had the significant effect and impact on a regional or national basis.

With approval of appropriations at levels recommended in the Authorization Bill, this legislation could greatly improve the conditions of existing lakes throughout our nation. Full appropriation and support of the programs and projects within the Clean Water Act of 1987 will make a significant impact on our environment and health of our citizens. It deserves your complete support and we recommend full funding for this important legislation.

The Ohio Lake Management Society commends Congress for re-authorizing the Clean Water Act. We respectfully ask this subcommittee to support our recommendations for funding sections 314 and 319 of the Clean Water Act. Thank you for the opportunity to testify before you.

The Hamilton County Park District and Ohio Lake Management Society thank you for the opportunity to testify in support of this important legislation.

STATEMENT OF
JON BRADY, DIRECTOR
HAMILTON COUNTY PARK DISTRICT
CINCINNATI, OHIO

Mr. Chairman and Members of the Subcommittee:

INTRODUCTION

My name is Jon Brady and I am Director of the Hamilton County Park District. Joining me is Robert Mason from our staff. As a local park and recreation agency rather than a state or national organization, we believe we can present a "grass roots" and perhaps a more basic perspective on the need for this critical legislation to receive this Subcommittee's important recommendation for full appropriation.

Robert Mason, our environmental specialist, is responsible for our resource quality program. Mr. Mason is representing the Park District with me and also the Ohio Lake Management Society (O.L.M.S.). It is our intention to present both the Park District's and the Ohio Lake Management Society's statements at this opportunity in order to save as much of the Subcommittee's valuable time as possible. Since Mr. Mason is extremely familiar with the Park District's needs and those of the lakes in our state, we hope to offer our testimony in this joint manner. In view of the many sections and complexities of the entire Act, the Hamilton County Park District and O.L.M.S. are more familiar with and believe our statement should be directed primarily in support of only one Section - The Clean Lakes Program (Section 314).

A BRIEF OVERVIEW OF THE HAMILTON COUNTY PARK DISTRICT

Our Park District preserves and protects over 9600 acres in our sixteen parks and nature preserves in the Cincinnati and Hamilton County area in Southwestern Ohio. The Park District also provides a number of other services to our community and environment. These include flood control and active recreation with attendance exceeding several million visitors each year. As the Park District nears its 60th anniversary, we have a solid financial foundation with over 70% of our budget resulting from earned income, donations or bequests. Less than 30% emanates from taxes. Our strong management and fiscal responsibility has engendered overwhelming support from the community we serve. The Park District offers nature programs, land management, six golf courses, several campgrounds, 24-hour ranger protection, sixteen refreshment stands, nature and physical fitness trails, frisbee golf courses, horseback riding and four large lakes and several ponds for fishing, boating and environmental purposes. Our lakes, with their many recreational activities and natural resource benefits are extremely important to our community, the quality of life of our citizens and for the animal and plant life nourished by the water.

So important are our lakes, that we have developed our own very effective in-house, two employee environmental protection department, in essence - a miniature EPA. The purpose of this department is to continually monitor in-coming water quality of our county's creeks, streams, surface run-off, outflows of sewers, both sanitary and storm water, and effluents from sewage treatment systems.

NATIONAL NEEDS

Our Country's natural and man-made lakes are in great distress. Pollution, both point source, non-point source, sedimentation resulting from uncontrolled development within the watershed and poor land practices have devastated many and certainly impacted the remaining lakes. Due to the scope, the multiple jurisdictions, the need for legislation and comprehensive controls and the large costs involved, a strong national commitment is needed to compliment and support the efforts by the state, regional and local agencies. Since the establishment of the Clean Lakes Program in 1972, the North American Lake Management Society reports twice as many lakes and reservoirs in our nation have experienced further deterioration as have been restored. This statistic should not be interpreted as criticism of the Clean Lakes Program, but rather it indicates how much still needs to be done and how much we still need the program in order to do it. Although financial support for Clean Lakes has been limited in the past, Congress deserves great praise for once again recognizing the need and re-authorizing the Clean Water Act. With full appropriation of the funding levels cited in the Act, the health of our environment will certainly be dramatically improved. Unfortunately, the financial limitations of the Act are such that only a very small portion of the actual needs will ever be met. However, it is a start and it is a recognition of the importance of the condition of lakes. Although Congress mandated Clean Water as a National policy many years ago, significant progress has been minimal. More education, more funds, more emphasis and more concern are needed. We strongly recommend full appropriation for this important legislation.

LOCAL NEEDS

Clean lakes are particularly important to Ohio, since Mother Nature has not blessed our state with natural lakes. Instead, our lakes, ponds and impoundments had to be created for flood control, storm water detention, recreation, boating, fishing, conservation and to provide habitat and to establish ecosystems for plant, animal and all forms of aquatic life. These lakes are critical to our lives, property and protection of our natural resources. Ohio is a highly populated state with a significant industrial and agricultural base that needs clean water to survive. Without the appropriate environmental safeguards to protect these resources, our lives, businesses and property, the environment will continue to diminish and deteriorate. The importance of these lakes cannot be underestimated. In 1980, the Ohio Department of Natural Resources in survey findings published in its 1980-1985 Ohio Statewide Comprehensive Outdoor Recreation Plan determined the region around Cincinnati needed a 200% increase in recreational water for boating and a 267% increase for fishing. Since that survey, no new lakes have been added and indeed, 50% of two existing lakes have been lost. Within our own Park District, we have four major lakes which serve as excellent examples of the great need to control pollution. Two have been virtually destroyed from the ravages of pollution and sedimentation resulting from forces and communities outside our park boundaries and jurisdiction. We have made great improvements to both of these lakes through our own efforts, without any financial assistance from the U.S.E.P.A. or through the Clean Lakes Act. As successful as our efforts have been, the Clean Lakes Program with appropriate funding of the Clean Lakes Section would have accelerated the entire process, eliminated many duplicative costs and probably resulted in a more comprehensive and complete solution. Much time, energy, and labor was lost by our staff in duplicating an existing but unfunded program. The

U.S.E.P.A.'s scientific, legislative and planning resources could have proved invaluable. Although the Park District has been able to reduce pollution, control the environment, secure funds, and initiate removal of sediment from Sharon Lake, it was very nearly an impossible task. Few agencies with similar limited manpower, expertise and experience would be so foolhardy to ever attempt such a monumental restoration effort on their own. The Park District's success was due to a unique set of circumstances, highly dedicated and motivated individuals and strong support generated from a variety of private and public sources. One and a half million dollars was eventually secured through State Capital Improvement Funds, a half million dollar contribution through sale of parklands and another half million dollars was sacrificed from other parks to implement the restoration. At the same time, local residents in a nearby low income area voluntarily assumed an assessment which will generate two million dollars to finance a sewer project to protect the lake from that community's sewage. Without the similar intervention and expertise, experience and capabilities of the U.S.E.P.A. financially supported by Congress with our tax dollars, it seems clear our nation's lakes will continue to deteriorate, fill with pollution and sediment, become health hazards, and many will completely disappear.

The second Park District lake at Winton Woods is in desperate need of restoration. It will require a 10 million dollar effort that even when complete, will not address all of the point source and non-point source pollution within the watershed. Over half the lake has filled in since its initial construction, due to incredible residential and commercial development within its watershed during the 1950's and 1960's. The loss of half of the lake has dramatically increased the negative effects of the pollution entering the lake. This proposed restoration, even though it will not address all the concerns, will still provide significant information and improvement to this vital lake. Even if Congress fully funds the Act at its authorized level, our Park District does not expect any direct financial assistance for the actual restoration project. We hope that funds might be provided to study the sources of pollution within the watershed. The assistance of the Clean Lakes Act is critical for the improvement to and elimination of the point and non-point source pollution of this lake, which is actually owned by the United States Government through the U. S. Army Corps of Engineers.

The two remaining Park District lakes are virtually pollution free as, we completely control one of the watersheds and approximately 90% of the other. However, at Miami Whitewater Lake, the 10% in private ownership is now being developed with residential construction and pollution and sedimentation is already evident and the effects are growing each day. In this particular case, with the planning and financial assistance of the Clean Lakes Program, our Park District should be able to arrest and control the pollution and sedimentation before it overtakes and destroys the entire lake, as noted in the previous examples. With swift action, the lake can be preserved and protected now at only a fraction of what it would certainly cost to restore the lake at a later date.

RECOMMENDATIONS

The wise stewardship of land, water and natural resources and indeed, the environmental health of our nation rests with Congress and the Administration. This great responsibility is mitigated and compromised by weighing the tremendous needs against the limited available funds.

We believe that two major goals can be accomplished through Congressional action to fully appropriate the Clean Lakes Program. A large number of lakes can be significantly protected, improved and even restored through funding of projects. Secondly, the immediate implementation of plans and environmental controls will not only work to preserve the water quality and evironment, but will eliminate and greatly reduce the need for costly restoration efforts in the future. Wise investment in productive and effective measures now will save untold damages and expenses in the future.

The Hamilton County Park District urges that the HUD-Independent Agencies Subcommittee of the Senate Committee on Appropriations give its support to full funding of Section 314 - the Clean Lakes Program of H.R.1 - The Clean Water Act of 1987.

STATEMENT OF ROBERT MASON

REPRESENTING THE OHIO LAKE MANAGEMENT SOCIETY

Mr. Chairman and Members of the Subcommittee:

The Ohio Lake Management Society (OLMS) is a state organization made up of citizens, scientists, lake managers, lake associations and industrial environmental specialists who are very concerned about the continuing degradation of our nation's and our state's water resources.

Lake monitoring data shows that over one-half of all lakes and reservoirs in the nation are degraded or threatened by pollution due to nutrients, siltation and toxic substances. The situation is getting worse, not better. The EPA and the States are not making the progress needed to improve our lakes and reservoirs in a timely fashion. Federal appropriations are needed to meet the amended section 314 for lakes and reservoirs, and the new section 319 non-point pollution management program.

SECTION 314

OLMS urges this subcommittee to approve full appropriations for EPA's section 314 Clean Lakes Program for $25 - $30 million per year for five years. This is especially important for Ohio, who is currently in the process of developing a self-supporting lake protection program. Federal funds are needed to help establish and fund a viable State Lakes Program in Ohio.

OLMS recommends that EPA create an Office of Lake & Reservoir Protection to administer section 314 monies and facilitiate states in developing sound State Lakes Programs.

In order to aid states in developing State Lakes Restoration & Protection Programs, the Committee should appropriate $5 million/year FY 1987 through 1990 for section 314(c) ($100,000 per state, per year).

SECTION 319

OLMS requests the Committee to approve full appropriations of $70 million for FY 1988 for section 319 Non-point Pollution Management Program. The section 319 funding should first go to state water quality agencies that have programs to administer the funding within the states before disbursement to other state agencies.

It is important that Congress have results of non-point pollution controls in several demonstration watershed projects, so it can have a basis for recommendations for the next re-authorization of the Act. EPA should be directed to use section 319(h) (5) Priority for Effective Mechanisms to immediately begin demonstration projects to attain results in time for review during future re-authorization hearings.

Our concern about Ohio's lakes is warranted because a significant number are moderately to severely impaired by turbidity, sedimentation, toxicants, and nuisance growths of aquatic weeds and algae.

The Ohio Lake Management Society is only one year old. but has already made significant impact in the state. As a formal organization advocating lake and reservoir management and restoration. we have made the state agencies aware of the needs of Ohio's lakes and reservoirs. This has culminated in the First Regional Symposium on Lake & Reservoir Management held in Columbus on May 4 and 5. 1987.

SUMMARY

The Ohio Lake Management Society commends Congress for re-authorizing the Clean Water Act. We respectfully ask this subcommittee to support our recommendations for funding sections 314 and 319 of the Clean Water Act. Thank you for the opportunity to testify before you.

STATEMENT OF DEBORAH HORTON, TRAINING MANAGER, METCALF AND EDDY SERVICES, INC.

Senator Proxmire. And now, we will hear from Deborah Horton, training manager of Metcalf & Eddy, Inc., and past president of the National Environmental Training Association, about funding for several EPA programs.

Ms. Horton. Thank you, Mr. Chairman. In the past 10 years, I have served as a certification officer for the state of Wyoming and certified the competency of waste water operators. After that, I worked for the state of Utah and directed the 109(b) training facility for operators. During that 10 years, I have seen a lot of changes in the environmental policies and programs and fundings.

A lot of positive things have happened during that time, and some of those happened in Congress. Two of the things in particular were the funding support for the 109(b) centers that are the state training centers within the states and for the 104(g)(1) program that gives over-the-shoulder training to operators at the small waste water plants.

INCREASE IN COMPLIANCE ACTIVITIES

EPA has also done some good things that have impacted positively the waters in the United States. The most important thing that they have done recently is to increase their compliance activities, and we have found in the past that without some sort of compliance activity from EPA, the communities and the owners of the plants do not tend to try to meet their effluent limitations.

The water quality problem is improving, but at the same time, there is more that needs to be done. The problem of poor effluent quality nationwide is complex and, because of that complexity, we need a plan that will solve the problem on many fronts, and we have to get away from the tunnel vision that we used in the past and tried to focus in on one reason why waste water was causing problems and tried to solve that one thing.

INTEGRATED COMPLIANCE STRATEGY

EPA does have a plan that should solve the problem in the long run. That is the integrated compliance strategy.

What this plan requires is that each state submit a plan for approval to EPA. Within the plan, the identified team members that work on environmental problems within the state at the waste water plants. Each team consists of the owner of the waste water plant, the regulatory agencies that are concerned, the trainers in the state that are concerned, the financial experts, and also the engineers.

Each one of these teams that has the responsibility to look at an effluent quality program and solve it in the big picture; they cannot solve just a training problem or just a design problem. They have to solve the entire problem and come up with long-range compliance. Many times these compliance plans, however, do include training for the operators; and what we are finding in the field here just recently, in doing these assessments, is that the operators are tending to learn their jobs by rote. You do not operate a treatment plant by rote because day by day conditions change, the effluent quality changes, and they cannot effectively operate their plant if they see one problem and react to it the same way every time, regardless of the cause.

Every time that the operators do this, they reduce the effluent quality at their plant. In order for the integrated compliance system to work, we need to do three things. Those three things are (1) to ensure that the states do get their plans in and approved; very few of those plans are in at this point; (2) we need to address urgently the need for toxic and hazardous waste training for the operators; and (3) where funding levels are currently too low for the training aspects, we need to look at other sources that already exist, such as 106 and 205 funds or increased users' fees.

In conclusion, I would like to take this opportunity to thank the subcommittee and EPA and Congress for the work that they have done so far to protect the water quality. In addition, I urge this subcommittee to continue their support of the 109 facilities and the 104(g)(1) training program and also do everything possible to accelerate the institution of the integrated compliance system and to expand its role to include toxic and hazardous waste at the municipal treatment plants.

Thank you for sharing your time.

EFFLUENT TAX

Senator PROXMIRE. Thank you very much, Ms. Horton. You speak about effluence. When you speak about that, that rings a bell to me. In some parts of the world, an effluent tax has been very successful in two ways. What it does is it provides an incentive for reducing the effluence that is put into the air or into the water—in this case, the water—and No. 2, it provides a source of revenue to help clean up the problem. In fact, there are some countries I understand that have had a superb record of cleaning up their waterways, making them remarkably clean, clean enough to swim in.

And at the same time the concerns that have done the tough, hard chemical work of converting effluent into some productive resource have found that it is possible. Have you given any thought to that?

Ms. HORTON. Yes; we have thought of a lot of different ways that you can fund the activities, and there are a lot of them available. That is one. There are several large cities, like Milwaukee, that process their sludge and sell it at a profit— Philadelphia does the same thing—as fertilizers. There are just myriad ways to fund these things. I do think we need to continue the support at the federal level; but at the same time, I do think we need to take your suggestion and be a little innovative in the funding for these programs.

Senator PROXMIRE. Is it fair to say that an emphasis on training treatment plant operators would result in the more efficient operation of treatment facilities and perhaps save construction grant money, reducing the need for gold-plating facilities as a way of minimizing operator error?

Ms. HORTON. I think that is absolutely true.

Senator PROXMIRE. All right; thank you very much. We appreciate that.

Ms. HORTON. Thank you.

[The statement follows:]

STATEMENT OF DEBORAH HORTON, TRAINING MANAGER, METCALF & EDDY SERVICES, INC.

SUMMARY

In order to keep the current compliance momentum from lagging, I urge this committee to support the following:

1. Continue the increased compliance activities of EPA toward owners who are out of compliance with their NPDES permits,

2. Continue supporting 109(b) Wastewater Operator Training Facilities with funding from the Construction Grant program available from PL 92-500,

3. Continue funding the 104(g)(1) over-the-shoulder training program, and

4. Accelerate the implementation of the Integrated Compliance System.

INTRODUCTION

This testimony is presented on behalf of Metcalf & Eddy Services, Inc. and myself as a private citizen.

M&E, since 1907, has been involved in the design, construction, operation, and staff training in publicly owned treatment works (POTW's). This history has given the firm a broad view of the challenges inherent in protecting the waters of the United States.

As an environmental trainer and operator certification officer over the past ten years, I have seen, first-hand, the problems encountered and successes realized by POTW staffs.

EPA has made several great strides in the last few years to improve the waters of the United States by ensuring POTW's meet their National Pollutant Discharge Elimination (NPDES) permit parameters.

In order to keep the current compliance momentum from lagging, I urge this committee to support the following:

1. Continue the increased compliance activities of EPA toward owners who are out of compliance with their NPDES permits,

2. Continue supporting 109(b) Wastewater Operator Training Facilities with funding from the Construction Grant program available from PL 92-500,

3. Continue funding the 104(g)(1) over-the-shoulder training program, and

4. Accelerate the implementation of the Integrated Compliance System.

ROLES

As in any industry, the owners and operators of POTW's do not work in a vacuum. Their success is partially dependent on other role players.

The U.S. Environmental Protection Agency, 109(b) State Wastewater Operator Training Facilities, 104(g)(1) trainers, professional organizations, consulting firms, and others directly impact the ability of the POTW staffs to maximize the performance of the treatment facilities.

With all of these entities working in concert, we have the largest probability of successfully protecting the waters of America and the capital investment in POTW's.

FIELD OBSERVATIONS

In the last year, Metcalf & Eddy Services has noticed a trend in the wastewater field which may contribute to compliance problems of POTW's.

As people learn, they tend to learn to define words and concepts and see the overall picture first. (Knowledge level)

Next, they learn how things work and why things happen the way they do. (Comprehension level)

Third, they learn how to apply these principles to the real world in which they work. (Application level)

And finally, they use all of the other information they've gained to solve problems, develop plans, and perform other complex tasks. (Problem-solving level)

Because of the way people learn, you can expect people to know the most about the most basic level of information (knowledge level) decreasing toward the least knowledge about the most complex level (problem solving level).

This should be true for wastewater treatment plant operators as it is for other learners.

However, in recent testing of seasoned operators, many of them scored lower than expected on basic items, highest on the application level, and less well than expected at the problem-solving level.

This unusual learning curve for wastewater operators is probably due to:

-- A general lack of continuous training on basic wastewater concepts, and

-- Inordinate attention paid to how things are done on the job site.

When this happens, application level material is usually taught by rote, which reduces it to the knowledge level.

In this case, the operator learns to do daily tasks at his plant very well and scores well on questions about his plant. However, he doesn't always have a good understanding of why his plant operates the way it does or what happens inside the tanks when process control changes are made.

This adversely impacts his ability to solve problems, plan, and perform other complex tasks. This ability is vital to the efficient operation of a wastewater treatment plant.

TRAINING NEEDS

It is evident from this that wastewater training must begin with the basics and build into problem solving over a period of time and occur in an continuing program.

This type of program develops operators with good skills at the problem solving level while maintaining excellence at the application level.

A common result of poor problem solving ability is that treatment plants are allowed to operate ineffectively until the NPDES permit is violated. At that point, compliance action is taken and, in many cases, appropriate training is mandated by EPA.

In order to change this trend and increase compliance rates, it is important to:

-- Motivate operators and owners to comply with the regulations and operate and maintain their plants,

-- Teach them the basics of wastewater technology so they can build high level O&M skills,

-- Offer technical assistance to help them apply concepts to their plant, and finally,

-- Provide problem solving advice when necessary.

In order to provide this type of service, the four areas mentioned above must be sustained and accelerated.

EPA COMPLIANCE ACTIVITIES

It has been demonstrated that compliance activities by EPA and the states tend to motivate facility owners to operate POTW's in compliance with NPDES permit levels.

Two years ago, EPA took a harder stand on the compliance issue and began issuing consent decrees and taking other measures to insure compliance, primarily of the major facilities. As a result, the rate of compliance in the major facilities has been increasing.

The goal for total compliance of all facilities is July 1, 1988. In order to meet this goal, EPA is planning a more aggressive compliance program in 1987 and 1988.

Compliance activities by EPA are certainly an integral link in the process of bringing all plants into compliance. An even more aggressive program will further help.

STATE TRAINING FACILITIES

State Operator Training Facilities offer basic levels of wastewater training in degree and certificate programs, application level information at small facilities with 104(g)(1) funds, and many offer troubleshooting advice.

EPA has funded state operator training facilities in slightly more than half of the states. These facilities are funded with 109(b) funds from the Construction Grants program.

EPA funded training facilities, along with state funded facilities, are providing a valuable service to POTW's. Most of the facilities offer certificate or degree programs to train new people in the field, provide over-the-shoulder training through the 104(g)(1) program, interface with the professional organizations at the state and national levels, and administer seminars to upgrade the skills of current wastewater professionals.

Two important trends are evident in these training facilities:

1. The first is the institution of the elements of quality training, introduced to Congress in the 1985 Report to Congress.

   By providing quality training at these facilities, students' employers are assured that their employees are learning skills that help them to perform their jobs better. In addition, students are learning more about how and why their plants work the way they do so they can correct problems before they result in noncompliance of the NPDES permit.

2. The second trend seen more and more often at the 109(b) centers is the marriage of wastewater technology with other associated fields.

> One example is the addition of RCRA training along with wastewater technology. Since treatment plants increasingly see hazardous wastes entering the flow stream as disposal of hazardous wastes becomes more difficult, it is a vital matter to train the operators how to handle these flows safely. The most cost effective way to provide this training appears to be to combine the current wastewater training ability with the fairly new discipline of toxic waste handling.

109(b) training facilities are a valuable resource and should continue to be built in states and territories that currently lack this resource.

104(G)(1) OVER-THE-SHOULDER TRAINING

For POTW's under 5 MGD, treatment plant staff can learn to apply the basic principles of wastewater to their own plants, diagnose potential problems, and solve problems before the plant is out of compliance through 104(g)(1) training.

This training is offered by training centers or state environmental quality departments and includes over-the-shoulder technical assistance to plants which are currently out of compliance.

The success of this program has been documented and shows that training has occurred in 2,000 small plants. The return to compliance is 55 to 60 percent. All of the plants have at least shown improvement in operation and maintenance.

This program has provided the first good documentation that training and technical assistance have a positive benefit in compliance activities.

Although 104(g)(1) funding is not available to major facilities, the owners of large POTW's are providing this level of training to their operators through training programs developed in-house or with the aid of environmental training consultants. Large training programs are becoming very sophisticated and well planned. As a result, staffs tend to learn the information necessary to appropriately operate and maintain their facilities.

INTEGRATED COMPLIANCE SYSTEM

EPA has instituted an Integrated Compliance System to support municipal compliance. The role players work as a team to ensure compliance and include the owner, the state regulatory agency, environmental trainers, and others who can impact POTW compliance.

The two major areas where the ICS can have the greatest impact is the compliance rate and the ability of each state to operate environmental programs cost effectively.

Because the ICS involves the owner, engineers, trainers, regulatory people, and financial experts as a team, the chance for long-term compliance is maximized.

Plant problems are identified and prioritized by the group and include design deficiencies, staff skill and knowledge deficiencies, financial limitations, and lack of management support.

Once the problems are identified for a POTW, the team develops a plan to resolve the problems and bring the plant into compliance. In this way, noncompliance problems can be solved early -- before enforcement actions become necessary.

The ICS approach can have an impact in two new areas.

Toxic and Industrial Wastes

The problems involving Industrial Pre-Treatment programs and toxic waste entry to treatment plants is becoming larger.

It would be relatively simple to add role players to the ICS, such as a RCRA representative and the owners of the industries which contribute to the flow of a plant, and solve this problem early.

Alternate to Enforcement

The second area is as a cost affective alternate to enforcement activities.

Since state regulatory agencies are working with the owners and trainers on ICS's, it is possible to help fund necessary training activities from federal sources.

Three sources of revenue are available to states that can be used to help fund necessary training activities: 205(g) funds, 106 funds, and user fees.

205(g) funds are provided from the Construction Grant program and are intended to help states manage this program.

106 funds are state program grants which total $65 million a year.

Both of these areas can be tapped to improve the compliance rates of POTW's. Since studies have shown that the two major problems in plants that are out of compliance are related to the skill and knowledge of the operators, it makes sense to use some of this money to train operators.

By judiciously spending a part of these funds on training for operators, compliance rates will increase and less money will be needed for enforcement activities.

It is ultimately the owner's responsibility to ensure the plant operates in compliance with the Clean Water Act. Therefore, user fees should be used to pay a portion of necessary training as well.

Training is a cost of doing business and needs to be budgeted along with operation, maintenance, repair, and replacement costs.

Although this system is in place, very few states have approved action plans. The states must be urged to accelerate the development of these plans because of the lag time inherent in the construction and design of necessary facilities.

CONCLUSION

It is vital that this subcommittee recommend continued funding, support and efforts to EPA compliance activities, 109(b) training centers, and 104(g)(1) programs where they exist now and in other areas of the country.

The Integrated Compliance System is a valuable asset in the effort toward providing quality water to the nation's people.

The program should be accelerated in its implementation, broadened toward the burgeoning problems of toxic and industrial wastes, and funded fully, from all available sources, to avoid the high costs of enforcement actions.

STATEMENT OF GERRY KENNY, KENNY CONSTRUCTION CO., WHEELING, ILL., AND IMMEDIATE PAST PRESIDENT, NATIONAL UTILITY CONTRACTORS ASSOCIATION, ARLINGTON, VA.

CONSTRUCTION GRANTS PROGRAM

Senator PROXMIRE. Our next witness is Gerry Kenny.

Before I introduce Mr. Kenny, let me just say that Senator Lautenberg was here and left some questions and unfortunately he had to leave.

Our next witness is Gerry Kenny of Kenny Construction Co. in Wheeling, Ill., and immediate past president of the National Utility Contractors Association. Mr. Kenny will talk about funding for EPA construction.

Mr. KENNY. Good morning, Mr. Chairman, and thank you.

I represent an association of over 2,000 construction companies throughout the United States that rely a great deal on the funding from the EPA Construction Grants Program. I would first like to publicly commend you, Mr. Chairman, and the committee for helping us last year with the interim funding due to the 16-month lag in the delay in the enactment of the Water Quality Act. That kept the program on a stable level, kept some programs going throughout the country, but most of all, it kept people employed in a very difficult time in the construction industry.

In regard to 1988 appropriations, I would like to ask for about $4 billion, but I don't think that is practical, and I don't think it is reasonable.

Senator PROXMIRE. You can say that again. [Laughter.]

Mr. KENNY. What I would like to ask you for, though, is your cooperation at a full funding level of $2.4 billion. It is necessary, and it is truly an underfunded figure; but it is one that is in the budget and we feel is very reasonable to live with. The federal government throughout the past number of years has been an active partner in the Construction Grants Program, and I think they should continue to be for the following reasons: One, because of the national municipal policy where we have until July 1, 1988, to clean up our water quality. No. 2 is because of the state revolving loan funds that have come into the new bill and will take some time for those people to get used to—the different states to enact their own revolving loan funds. Three, that in fiscal years 1986 and 1987, the funding was reduced by approximately $600 million, and this has been difficult to live with in the industry in terms of continuity, in terms of planning between the different agencies around the country, when they can let their work.

And it has also created some up and down swings in the construction job cycles in the Midwest and the midwestern states which have been affected a great deal by it because we have our weather swings where we can't do a lot of this work in the wintertime.

UNOBLIGATED BALANCE OF $1.5 BILLION

Finally, there is an unobligated balance that remains as of about a week ago of $1.5 billion in the EPA funds. This is definitely a significant amount of dollars but is not necessarily an inordinate amount of funds; and it remains there for a number of reasons. First of all, the planning process in the EPA construction grants program takes more than just a couple of weeks to get the plans and everything else done.

Second, the different agencies have to plan for continuity of funding, and there has been no true continuity of funding in this program since the late 1970's, where we have lived hand to mouth, and the different agencies have had to hold on to their funds and try and gather them in when they feel they are going to have more Federal money coming down the road.

Third, the uncertainty about the revolving fund requirements. Some states have not obligated their funds recently because of awaiting the firm guidance from EPA if they could put it into the revolving loan fund. Some states are prudently delaying grants in hopes they will be able to utilize these funds in their revolving loan banks as part of the program.

In summary, Mr. Chairman, we thank you for your past cooperation, and we look forward to working with you in the future on it; but we would recommend a full level of funding at $2.4 billion.

Senator PROXMIRE. Thank you very much. The President recommends, as you know, $2 billion. You are recommending $2.4 billion, a 20-percent increase. Where would you recommend we find an offset for that spending?

Mr. KENNY. What you brought up before could possibly be a user tax, a discharge tax, an effluent tax, as you were talking about. But I think in terms of looking at it and what the House and Senate have done, if I am not mistaken, is to authorize $2.4 billion. What we have taken a look is that, if you go back to 1980, there was approximately——

Senator PROXMIRE. The authorization is a ceiling. As you know, usually Appropriations has to come in to meet its overall targets well under the authorizations.

Mr. KENNY. Sir, that is when we look to people who are friends of good water to supply the good water to us and to our future generations down the road. And I think it is an investment in the future.

Mr. MCDERMITT. If I might add, Mr. Chairman, I think you would be the first to agree that the President's budget proposal is more or less a "wish list" and that both the House and Senate budget resolutions do assume $2.4 billion in 1988 funding for the program.

Senator PROXMIRE. Very good. We would like to have any advice you can give us on cutting it somewhere. Thank you.

Mr. KENNY. Thank you, sir, for your time.

[The statement follows:]

STATEMENT OF GERRY KENNY, KENNY CONSTRUCTION CO., WHEELING, ILL., AND IMMEDIATE PAST PRESIDENT, NATIONAL UTILITY CONTRACTORS ASSOCIATION

Request Summary

The National Utility Contractors Association respectfully urges the Senate Appropriations Subcommittee on HUD-Independent Agencies to appropriate $2.4 billion in fiscal 1988 funding for the EPA Construction Grants Program.

Mr. Chairman and members of the committee, the National Utility Contractors Association (NUCA) is comprised of 2,000 companies nationwide -- contractors, suppliers and manufacturers -- that specialize in wastewater treatment and water delivery construction projects. NUCA members lay the pipe and build the treatment plants necessary to achieve the goals set forth by Congress in the Federal Water Pollution Control Act. In short, it is our job to build the projects necessary to meet the "clean water" requirements mandated by Congress.

As a result of our experience in building many of the sewage treatment facilities financed by the funding appropriated by this committee for the EPA Construction Grants Program, I wish to take this opportunity to offer the underground utility construction industry's views on the program and to offer our recommendations on fiscal 1988 funding for it.

Fiscal 1986-87 Funding

Before addressing myself to the question of fiscal 1988 appropriations for the program, I will take this opportunity to commend the members of this subcommittee for your outstanding leadership in maintaining a level of funding in fiscal years 1986 and 1987 adequate to enable the nation's water pollution control effort to move forward. As you are well aware, the 16-month delay in enactment of legislation to reauthorize the Construction Grants Program prevented House and Senate appropriations panels from properly financing the program on a regular yearly basis. Fortunately, this panel was instrumental in appropriating "interim" funding necessary to keep the program up and running until reauthorization language was finally enacted into law in February of this year.

Without the leadership of the members of this panel, the operation of this important program would have been seriously jeopardized. Your foresight prevented the shutdown of ongoing projects and delays in beginning new construction. NUCA publicly commends each of you for this achievement.

It should also be noted here that language releasing the fiscal 1987 funds previously appropriated -- but withheld pending enactment of the Water Quality Act -- is included in the supplemental appropriations package now being considered by Congress. The early release of this vitally needed financing will be a major step forward in again bringing the program up to speed in the months ahead.

Fiscal 1988 Appropriations

In regard to the issue at hand -- fiscal 1988 funding for the EPA Construction Grants Program -- I must emphasize NUCA's staunch opposition to President Reagan's proposal calling for $2.0 billion in construction financing. A return to a funding level of $2.4 billion annually beginning in fiscal 1988 is imperative if the program is to remain an effective tool in the nation's water pollution abatement effort.

I want to say at the outset that we, as underground utility contractors, obviously have a vested interest in the program and would hope to benefit from this funding by competitively bidding on the projects it will finance. The association feels that more of the funding burden must be assumed by state and local governments -- a requirement that is mandated in the years ahead by the Water Quality Act of 1987. The federal government, however, must remain a major partner in financing the program until the federal funding role is phased out in 1995, and a $2.4 billion appropriation for fiscal 1988 remains vitally important.

This committee is well aware of the results of the most recent EPA Needs Survey, which estimates that more than $60 billion in federal wastewater treatment construction work is needed for the current population. While EPA's bi-annual assessment has been viewed somewhat sceptically in the past as little more than state "wish lists," the new survey is viewed by most observers as a fairly accurate assessment of current needs as a result of changes made in the survey's format.

$2.4 billion in fiscal 1988 funding is particularly important to assist municipalities in their efforts to comply with the National Municipal Policy. This provision of the law requires local governments to complete construction on facilities necessary to meet federal water quality standards by July 1, 1988.

EPA reports that the nation's "major" facilities in larger urban areas are on schedule to meet the 1988 deadline. However, one should not interpret that to mean that their need for construction financing will end next July. Although they meet all requirements necessary to comply with the federal deadline, many local governments' schedules anticipate ongoing construction of their federally mandated systems into the end of this decade, with completion scheduled in the early 1990s.

In other words, construction work necessary to maintain the schedules established by larger communities (in addition to court-ordered schedules) in meeting July, 1988, deadline requirements will continue into the 1990s. It is important, therefore, that the full $2.4 billion in funding authorized for the program in fiscal 1988 is appropriated.

State Revolving Funds

Full funding in 1988 is also important to enable several states to begin to capitalize their new State Revolving Funds (SRFs). As mentioned earlier in my testimony, state and local governments must assume a larger share of the funding burden in building these sewage treatment systems, particularly in light of the burgeoning federal budget deficit. The Water Quality Act will require just that by establishing a schedule and mechanism for completing the transition from federal to state and local responsibility.

The new law terminates EPA's authority to award new federal wastewater treatment construction grants to communities in fiscal 1990. The agency is given new authority to "capitalize" State Water Pollution Control Revolving Funds (SRFs) to enable states to provide construction loans and other financial assistance to municipalities.

NUCA was a strong supporter of the inclusion of this provision in the Water Quality Act and views the phasein of SRFs as a historic and beneficial development. Repayments from local governments to a state fund will be utilized as new financing for other projects. These State Revolving Funds will create a reliable and ongoing source of construction financing for needed wastewater treatment works and, in the opinion of NUCA, will enable many more planned projects to go to construction.

The major requirement needed to accomplish the goal of financially sound and efficient SRFs, however, is an adequate source of federal funding to initially capitalize them. An appropriation of $2.4 billion for the program in fiscal 1988 is critical, therefore, in beginning an orderly phaseout of the federal role.

Although the law requires the establishment of SRFs no later than fiscal 1991 (by 1989 unless states are willing to risk forfeiture of as much as 50 percent of their annual federal allotment), several states have seen the handwriting on the wall and have already established some type of state revolving fund. EPA officials estimate several such state programs will qualify as a certified SRF and will begin utilizing some portion of their fiscal 1988 federal allotment as a source of capitalizing their revolving fund.

Mr. Chairman, the success of State Revolving Funds is clearly crucial to continuing the extensive progress that the nation's war on water pollution has thus far achieved. A $2.4 billion appropriation in 1988 -- and annually through 1991 -- is necessary if this new era in wastewater treatment construction financing is to prove successful. To shortchange states as they are about to enter this new era would, in our opinion, renege on Congress' commitment to them and would significantly deplete the nation's arsenal in its fight against the pollution of our waterways.

One last point I feel needs to be mentioned is that funding for the EPA Construction Grants Program was effectively reduced by 12.5 percent ($600 million) over a two-year period in fiscal years 1986 and 1987. This occurence was, again, the result of the lengthy delay in enactment of a reauthorization measure. In fiscal 1986, Congress appropriated $2.4 billion in funding, but only $1.8 billion was released to the states for construction.

In fiscal 1987, $2.4 billion was again appropriated. However, that figure was achieved by utilizing $600 million in "carryover" funds from fiscal 1986 and $1.8 billion in fiscal 1987 money. As a result, only $4.2 billion of the $4.8 billion authorized for the program by the Water Quality Act was released to the states for sewage treatment facilities construction.

As an association of business executives concerned about the federal budget deficit, NUCA understands the need to reduce federal spending wherever prudent. In addition, we sympathize with the dilemma facing this and other appropriations panels in your monumental task of attempting to control spending. The $600 million shortfall in spending for the program is important, however, and lends further credence to the need for a full $2.4 billion appropriation for the next fiscal year in order to bring the program "up to speed" in future months and years.

Unobligated Balance

NUCA also wishes to address the important issue of the unobligated balance of funds remaining within the Construction Grants Program. As of three weeks ago (April 8), EPA reported an unobligated balance of $1.6 billion in appropriations remaining from previous fiscal years. Obviously, this figure will increase when action is completed on the '87 supplemental appropriations measure, which is likely to include the release of the remaining $1.2 billion originally appropriated for the program.

The figure is significant, but it is not unusual -- and there are three basic reasons for it:

1.) Lengthy projects. Although roughly 20 percent of EPA grants have traditionally financed pipeline-related projects that can generally be completed in a relatively brief period, the vast majority finance large and often complicated treatment plants built over a period of years.

When municipalities receive word to proceed with construction via notification of a grant award, they must undertake a necessary, but often time consuming, process before ground is broken. Such steps as finalization of the bid procedure, local council meetings, public bid notifications, acceptance and review of submitted bids, and other procedures must be taken before a contractor actually begins work. Construction may then proceed for several months or as long as two years, depending on the scope of the project, unforeseen site conditions, weather and other factors. As a result, a fast "turnaround" in the obligation of appropriated money has traditionally not been the case when compared to some other federal programs simply because of the nature of this type of construction.

I will note, however, that the process has been significantly accelerated within the past few years. Most municipal officials today request a grant for construction only after most of the necessary details have been established. Previously, it was common for them to receive a grant award before completing the final design of their project.

It is also important to note that EPA officials expect the flow of outlays to occur much more rapidly when State Revolving Funds are in operation.

2.) Funding disruptions. Because of funding disruptions the past two years, many states are uncertain if, or when, they will receive the remainder of their 1987 grant allotment. As a result, they are not spending the '87 funds they have received until they are certain whether or not remaing federal funds are released to them. In short, funding uncertainties have disrupted the planning process for state officials.

Consider this scenario: A state has ten projects listed for construction on its priority list that will be built if the state receives its full allotment for the year. Projects one through five on the list are not yet ready for construction, but they will be in August. Projects six through ten are now ready for construction. If the state receives only 50 percent of its allotment, and is uncertain if the remainder is forthcoming, should it spend the funds already on hand on the projects lower on the priority list? Or should it delay funding them in hopes of receiving the remainder of its federal money, in which case all of the ten projects, particularly those at the top of the list, could be built? Many states are simply sitting on their funds for this highly justifiable reason.

3.) SRF uncertainty. Some states have not obligated their funds because they are awaiting firm guidance (or regulations) from EPA on requirements to establish a State Revolving Fund. They are apparantly delaying grants in hopes that they will be able to utilize these funds for use in their SRF. In light of the projected benefits of the SRF concept, this would seem to be a prudent decision on their part, although it does add to the amount of the unobligated balance reported by EPA.

Conclusion

In summary, Mr. Chairman, I respectfully urge this panel to appropriate $2.4 billion for the EPA Construction Grants Program in fiscal 1988. I feel this figure is both reasonable and responsible in light of the current need for this construction financing and the benefits derived from it.

This program is important, it is efficient and, above all, it is largely responsible for the documented improvement in the quality of our nation's waters. Thank you for granting me the opportunity to appear before you here today.

STATEMENT OF BYRON FARRELL, ASSOCIATED GENERAL CONTRACTORS OF AMERICA

CONSTRUCTION GRANTS PROGRAM

Senator PROXMIRE. Our next witness will be Byron Farrell for the Associated General Contractors of America on the subtopic of EPA's Water Quality Act.

Mr. Farrell, we are happy to have you here. Go right ahead, sir.

Mr. FARRELL. Good morning, Mr. Chairman. It is indeed a pleasure to have the opportunity to testify before you. As you said, my name is Byron Farrell; I am a construction contractor from Wood River, Ill., representing the Associated General Contractors of America, which is 32,500 firms employing more than 3.4 million people doing 80 percent of the contract construction in this country.

I appreciate the opportunity to testify before this committee on the important topic of funding the Construction Grants Program. AGC urges this committee to fund the program for fiscal year 1988 in the full amount of the $2.4 billion authorized in the Water Quality Act of 1987, and also to include the $600 million which was not made available in fiscal year 1986.

The Water Quality Act of 1987 represents an important juncture in the Clean Water Program of the United States. Since 1972 when Congress passed what is now commonly called the Clean Water Act, the federal government has taken a strong lead role in construction of publicly owned waste water treatment facilities. This program has resulted in an investment of some $66 billion, including over $40 billion in federal funds in these treatment facilities.

The results have been significant, and a dramatic improvement in the quality of our nation's water with over 47,000 miles of monitored streams markedly improved. However, despite this tremendous progress, the job remains unfinished. EPA's 1986 need survey documents some $76.2 billion in treatment needs by the year 2005. Congress must not turn its back on this major investment and allow a deterioration of our existing waste water infrastructure nor allow the achieved water quality to be diminished by not continuing to meet existing and growing treatment needs.

INCREASING RESPONSIBILITY FOR STATE AND LOCAL GOVERNMENTS

When Congress recently reauthorized the Clean Water Act, it maintained minimum acceptable Federal involvement while gradually shifting responsibility for this program to state and local governments. The new law sets forth a schedule of mechanisms to accomplish this transition. In the future, state revolving loan funds will be the funding source for the construction of waste water treatment facilities.

Federal capitalization grants will initially be provided to the states to establish these funds, and states will be required to match these grants with a 20-percent contribution.

The aspect of this program which makes it so promising is that the funds will be self-perpetuating because local governments will be required to establish a dedicated source of revenue for repayment of the loans. The law also requires the loan recipient to establish a user charge system. AGC strongly supported the congressional effort to continue the progress toward improved water quality by compelling local governments to meet their obligation to pay the costs associated with this service. The obligation of local governments is conditioned on the federal government meeting its obligation to ensure the foundation of funding support is maintained.

The funding levels which were agreed to in the 1987 law are minimum funding levels. Full funding to these levels is paramount if the Construction Grants Program is to continue unimpeded.

We have already unfortunately seen a retreat from these minimum funding levels. In fiscal year 1986, the Construction Grants Program was severely underfunded by $600 million. This committee is to be commended for ensuring that the $1.2 billion in funding in the program in fiscal year 1987 that had been withheld pending final reauthorization is restored. However, the $600 million in underfunding caused significant problems.

The program was cut back significantly in 1981 when the annual federal authorization was cut in half. That cut put the program at its lowest acceptable funding level necessary to maintain its progress.

One final point needs to be addressed. Because of uncertainty over final approval of reauthorization of the Clean Water Act, States were slow in obligating funds this past year. This slowness in spending of appropriated funds should not be viewed as an indication of lack of need or lack of desire to address the problem.

Thank you, Mr. Chairman and members of this committee for the opportunity to voice AGC's support.

Senator PROXMIRE. Thank you very much, Mr. Farrell. I had a couple of questions, but you answered them in your testimony.

We appreciate it.

Mr. FARRELL. Thank you.

[The statement follows:]

STATEMENT OF BYRON FARRELL, ASSOCIATED GENERAL CONTRACTORS OF AMERICA

The Associated General Contractors of America and its 106 chapters nationwide represents more than 32,500 firms, including 8,000 of America's leading general contracting companies which are responsible for the employment or more than 3,400,000 individuals. These member contractors perform more than 80 percent of America's contract construction of commercial buildings, highways, industrial and municipal-utilities facilities.

I appreciate the opportunity to testify before this committee on the important topic of funding for the construction grants program. AGC urges this committee to fund this program for fiscal year 1988 in the full amount of the $2.4 billion authorized in the Water Quality Act of 1987 and also to include the $600 million which was not made available in fiscal year 1986. The Water Quality Act of 1987 represents an important juncture in the Clean Water program of the United States. Since 1972, when Congress passed what is now commonly called the Clean Water Act, the Federal government has taken a strong lead role in the construction of publicly owned wastewater treatment facilities. This program has resulted in the investment of some $66 billion, including over $40 billion in federal funds, in these treatment facilities. The result has been a significant and dramatic improvement in the quality of our nation's waters with over 47,000 miles of monitored streams markedly improved.

However, despite this tremendous progress the job remains unfinished. EPA's 1986 needs survey documents some $76.2 billion in treatment needs by the year 2005. It must be kept in mind that this number was derived using very strict and newly established criteria for documenting the needs. It must also be pointed out that this needs estimate does not include water treatment items which are ineligible for federal funding. The Congress must not turn its back on this major investment and allow a deterioration of our existing wastewater infrastructure nor allow the achieved water quality to be diminished by not continuing to meet existing and growing treatment needs.

When Congress recently reauthorized the Clean Water Act, it maintained minimum acceptable Federal involvement while gradually shifting responsibility for this program to state and local governments. The new law sets forth a schedule and mechanism for accomplishing this transition. In the future, state revolving loan funds will be the funding source for the construction of wastewater treatment facilities. Federal capitalization grants will initially be provided to the states to establish these funds and states will be required to match the grants with a 20 percent contribution. The aspect of this program which makes it so promising is that the funds will be self perpetuating because local governments will be required to establish a dedicated source of revenue for repayment of the loan. The law also requires the loan recipient to establish a user charge system.

AGC strongly supported this Congressional effort to continue the progress towards improved water quality by compelling local governments to meet their obligation to pay the costs associated with this service. This obligation of local governments is conditioned on the federal government meeting its obligation to ensure that the foundation of funding support is maintained. The funding levels which were agreed to in the 1987 law are minimum funding levels. Full funding to these levels is paramount if the construction grants program is to continue unimpeded.

We have already and unfortunately seen a retreat from these minimum funding levels. In fiscal year 1986 the construction grants program was severly underfunded by $600 million. This committee is to be commended for ensuring that the $1.2 billion in funding for the program in FY 87, that had been withheld pending final reauthorization, was restored. However, the $600 million in underfunding from fiscal year 1986 and the 21 percent cut in FY 87 funding currently in the House bill will continue to plague the efficiency of the construction grants program until restored.

While this association fully recognizes the need to reduce federal spending and, in turn, reduce the federal deficit, AGC urges Congressional recognition that some Federal spending has a more significant impact on the nation's economy than other federal spending. The EPA construction grants program is a case in point. The EPA construction grants program must be viewed as an investment in America's future. Construction grants spending produces jobs and a higher quality of life by improving the nation's water quality.

The program was cut back significantly in 1981 when the annual Federal authorization was cut in half. That cut put the program at the lowest acceptable funding level necessary to maintain its progress. The latest move to transfer the program to the states also contributes significantly to deficit reduction. No further cuts should be considered.

One final point needs to be addressed. Because of uncertainty over final approval of reauthorization of the Clean Water Act, states were slow in obligating funds this past year. As a result there is a significant backlog of funds still available for obligation. This slowness in spending the appropriated funds should not be viewed as an indication of a lack of need or lack of desire to address the problem. The EPA needs survey addresses total needs and does not project them on an annual basis. Now that reauthorization has been accomplished states should move quickly to ensure that obligations and appropriations come into line.

Thank you Mr. Chairman and members of the Committee for this opportunity to voice AGC's support of full funding for the EPA construction grants program.

STATEMENT OF PATRICK MARCHESE, EXECUTIVE DIRECTOR, MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

CLEAN WATER ACT

Senator PROXMIRE. Our next witness is Patrick Marchese, executive director of the Milwaukee Metropolitan Sewerage District, who will discuss continued funding for the Federal Water Pollution Control Act and the Construction Grants Program for fiscal year 1988.

Mr. MARCHESE. Thank you, Mr. Chairman. Mr. Chairman and members of the committee, my name is Patrick Marchese, and I am the executive director of the Milwaukee Metropolitan Sewerage District, which serves approximately 1 million people in and around Milwaukee, Wis. As you know, $1.2 billion of the promised $2.4 billion for fiscal year 1987 has been appropriated for the Clean Water Act. That amount has allowed us to continue our efforts to meet the standards and deadlines of the act.

Appropriation of the remaining $1.2 billion authorized for fiscal year 1987 and full funding for fiscal year 1988 and beyond is absolutely vital to the success of the Milwaukee Pollution Abatement Program and those of hundreds of other cities.

Milwaukee's program is a multiyear effort designed to meet the requirements of the act. It was planned to be completed in 1996 at an estimated cost of $1.9 billion, excluding interest on local borrowing. We have aggressively pursued the completion of our program. Over the past 10 years of our program, federal grant assistance has been less than 40 percent of incurred costs. If you assume full funding at the current authorized appropriation level, we estimate that this already low percentage will decline even further to approximately 30 percent when our program is complete.

This is less than the 75 percent contribution originally promised by Congress and obviously less than the 55 percent contained in the 1981 amendments of the act.

A full funding assumption will fund only 8 of our remaining 47 projects. Failure of Congress to maintain its already reduced funding support for the Construction Grants Program would be sorely felt in Milwaukee, in Wisconsin, and in all other states. In Milwaukee, it would mean construction delays, increasing costs due to inflation, higher costs for our local taxpayers, and, of course, continued environmental problems.

As you know, EPA and the states are moving assertively and aggressively to bring hundreds of minor systems into compliance as well as the large cities. At the same time, Congress has made other environmental mandates stricter, especially in the area of solid waste disposal, storm water management, and drinking water. It is likely that these programs will be done without significant federal assistance. The costs of these programs, which will have to be borne by local governments will be enormous.

CONTINUATION OF FEDERAL COMMITMENT SOUGHT

We recognize the problems facing Congress and the administration and can understand the need to reduce federal spending. However, we do not believe that it is fair or right to reduce Clean Water Act funding now. federal spending for clean water was cut in 1981 and in 1986. It is essential that the federal government continue its commitment to providing grants for waste water treatment systems, and I urge you in the strongest possible way to approve the remaining $1.2 billion of fiscal year 1987 funding for the Construction Grants Program and the $2.4 billion amount authorized for fiscal year 1988. federal assistance, which is raised through a progressive tax system, has made it possible for my agency to undertake a giant public works project which meets the national goal of the Clean Water Act and shields local residents particularly those least able to pay from major tax increases.

With your continued support, we will finish the job for clean water in this country. Thank you, Mr. Chairman.

Senator PROXMIRE. Thank you very much, Pat, for an excellent statement. I understand that the authority to release the $1.2 billion is in the supplemental, which is pending now. We thought we would pass that yesterday, but we weren't able to do that, and we probably won't be able to act on it until next week, but it is there.

This is a very, very tough situation, as you know. You say that the federal assistance is raised through a progressive tax system. The trouble is that part of it is raised through a progressive tax system, and much of it now is borrowed. As you know, we are running collosal deficits that are grossly irresponsible and mean that future generations are going to have to pay mammoth interest on the huge federal debt.

So, we are under great stress and pressure, but we know what a problem you have and what a fine job you have been doing back there. We want to do all we can to help, and we certainly will do that.

Mr. MARCHESE. Thank you very much, Mr. Chairman.

[The statement follows:]

STATEMENT OF PATRICK MARCHESE, EXECUTIVE DIRECTOR, MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

Summary. Continued funding for the Federal Water Pollution Control Act Construction Grants Program is vital to Milwaukee, Wisconsin and cities throughout the nation. It is requested that full funding of the authorized amounts for this program be made in the amounts of $1.2 billion for the remainder of Fiscal Year 1987 and $2.4 billion for Fiscal 1988.

Statement. Mr. Chairman, members of the committee, my name is Patrick Marchese and I am executive director of the Milwaukee Metropolitan Sewerage District which serves a 420 square mile area in and around Milwaukee, Wisconsin. Thank you for the opportunity to testify this morning on a matter of vital importance to Milwaukee, to Wisconsin, and to the nation. I certainly am aware of and appreciate your efforts to assure continued funding for the construction grants program during recent deliberations concerning extension of the Federal Water Pollution Control Act.

As you know, only $1.2 billion of the promised $2.4 billion for Fiscal Year 1987 has been appropriated. That amount has allowed us to continue our effort to meet the pollution abatement standards and deadlines of the Clean Water Act which the Congress reaffirmed early this year. Appropriation of the remaining $1.2 billion authorized for Fiscal 1987 and full funding for Fiscal Year 1988 and beyond is vital to the success of the Milwaukee's water pollution abatement program.

Milwaukee's program is a multi-year effort to comply with requirements of the Federal Water Pollution Control Act. Begun a decade ago, we estimate that our program will take until 1996 to complete at an estimated cost of $1.9 billion excluding interest on local borrowing. We have aggressively pursued completion of this program. The required facilities plan was expected to take five years to complete. We did it in three years. We have also placed design work on a fast track to save time and money and meet the requirements of the Act.

Over the first ten years of our program, federal grant assistance has been less than 40 percent of costs incurred. Assuming full funding of all currently authorized appropriations, we estimate that this already low percentage will decline even further to approximately 30 percent when our program is completed. This is less than the 75 percent contribution originally promised by Congress under the Federal Water Pollution Control Act and the reduced contribution of 55 percent contained in the 1981 amendments to that Act. Wisconsin's allocation of construction grant monies under a full funding assumption will fund only eight of our remaining 47 projects.

Failure of the Congress to maintain its already reduced funding support for the construction grants program would certanly belie the overwhelming commitment made to clean water by the Congress earlier this year and would be sorely felt in Milwaukee, in Wisconsin, and in all other states. In Milwaukee, this would mean construction delays, increased costs due to inflation and higher costs to local taxpayers who are already contributing more than their fair share to meet federal discharge standards.

I am sure that you are well aware that the EPA vigorously enforces the Clean Water Act's discharge standards. This is not news to my fellow administrators in many large American cities. It is, however, becoming more of an issue with my peers in small communities across the country. EPA and the states are moving agressively to quickly bring hundreds of minor systems into compliance as well as the large cities.

At the same time, Congress has made other environmental mandates stricter. Laws relating to clean drinking water standards, stormwater management and solid waste disposal have imposed or will impose significant new burdens on the Milwaukee area and other communities throughout the country. It is also likely that these programs will be done without significant federal assistance. The costs of these programs which must be borne by local governments in this age of changing mandates and increased responsibilities for local governments is enormous.

We recognize the problems facing Congress and the Administration and can understand the need to reduce federal spending. Federal spending for clean water was cut in 1981 and in 1986. In spite of this, the District's program remains on schedule and we hope to keep our program on schedule. But we cannot do it without your help. Communities like Milwaukee cannot bear the costs alone.

It is essential that the Federal Government continue its traditional commitment of providing grants for wastewater treatment system; and I urge you in the strongest possible way to approve the remaining $1.2 billion of fiscal year 1987 funding for the construction grants program and the $2.4 billion amount authorized for fiscal year 1988. Without full financial support,now and in the future, communities required to meet the standards set in the Clean Water Act and other unfunded federal mandates will find themselves unable to meet these mandates or find their user fees and taxes increasing to unaffordable levels.

Mr. Chairman and members of the Committee, I know that I speak for all wastewater treatment agencies when I say that your support has made a difference, and it is appreciated.

Federal assistance, which is raised through a progressive tax system, has made it possible for my agency to undertake a giant public works project which meets the national goals of the Clean Water Act and shield local residents, particularly those least able to pay, from major tax increases. With your continued support we will finish the job.

STATEMENT OF JOHN I. T. MOLONEY, VICE PRESIDENT AND GENERAL MANAGER, ENVIREX, INC., WAUKESHA, WIS., ON BEHALF OF THE WATER AND WASTEWATER EQUIPMENT MANUFACTURERS ASSOCIATION

Senator PROXMIRE. Our next witness is John Moloney, vice president and general manager of Envirex, Inc. in Waukesha, Wis. Mr. Moloney is representing the Water and Wastewater Equipment Manufacturers Association and funding for programs within the EPA Office of Water.

Go right ahead, sir.

Mr. MOLONEY. Good morning, Senator, and thank you for this opportunity to present our views before you and your committee. As you said, I am John Moloney, vice president and general manager of Envirex and from the good state of Wisconsin. We have many good manufacturing concerns in that industry in that state.

I appear before you and the committee today as a member of the Water and Wastewater Equipment Manufacturers Association. WWEMA has been in existence since 1905, following up on this theme. We are seeking your committee's assistance today in providing EPA sufficient resource support to properly carry out their responsibilities under the reauthorized Clean Water Act and the Safe Drinking Water Act.

WWEMA applauds the bipartisan decision of Congress to provide for a structured phaseout of the EPA Construction Grants Program and to lend support in the creation of state-administered revolving funds. WWEMA believes that, in spite of Congress' good intentions to achieve the vital goals of clean water, the program will fall short of reaching its objectives due to the continued withholding of full authorization levels.

We think these are the key years as we reach that 1988 date, and to fall short of funding and leaving cities such as Milwaukee in question in these key years is just really going to cause us to fall short of the goal. Of the $2.4 billion appropriated for fiscal year 1987, $600 million was carried over from the prior year's sum, a shortfall, placing the real fiscal year 1987 appropriation level at $1.8 billion. Only $1.2 billion of that amount has been released, pending reauthorization of the act.

SUPLEMENTAL APPROPRIATION BILL

The supplemental appropriations bill currently before Congress included language to release the remaining $1.2 billion for the year. When the House voted last week to approve a 21-percent across-the-board reduction in the supplemental bill, the grants program suffered an additional $253 million cutback.

In addition, the supplemental appropriation request for the program once again failed to address the $600 million from the prior year.

Finally, with regard to fiscal year 1988 appropriations, the administration has again requested only $2 billion for the Construction Grants Program. These actions, if not properly remedied, could underfund the program by over $2.4 billion, and this over a 3-year period. This represents a full year of funding. WWEMA urges Congress to either provide for the immediate release of the $1.2 billion fiscal year 1987 funds and the $600 million in carryover funds or to increase the 1988 appropriation level by such sums.

In addition, WWEMA strongly urges the committee's support to appropriate all of the $2.4 billion authorized for the 1988 program. Failure to provide these funds could damage progress already gained.

We would also like to comment on the Drinking Water Program, the need for the research that is necessary in those programs and for the state grants to support the things that are required in that area. One of the most critical challenges facing the nation in achieving these standards is the ability of small water systems to meet the statutory provisions. Despite Congress' acknowledgement that technical assistance to rural water systems is vitally important, the administration has ignored the need by proposing total elimination of funds in the 1988 budget for such programs.

We find this incomprehensible, and we seek the committee's support for the full $10 million for this program. Finally, WWEMA urges the committee to fully support the funding levels requested by the administration for the Drinking Water and Water Quality Enforcement Programs. Thank you for the opportunity to present our views.

TECHNICAL ASSISTANCE FUNDING

Senator PROXMIRE. Thank you. In your testimony, you make an eloquent argument for funding technical assistance. I know you did not argue that funds to support monitoring for unregulated drinking water contaminants be restored in the budget as well. Do you think it is more important to fund technical assistance than to help small systems pay for monitoring?

Mr. MOLONEY. They are perhaps a common problem. The technical assistance is required to meet and to understand these contaminants and to develop the ongoing laws. The one area that really has the least resources and the least capability for doing it is our small associations. We have seen some nice programs in that area, in the National Rural Water Association Circuit Rider Program. They provide good training in operation and maintenance and help, and it leads to that kind of support.

Senator PROXMIRE. Thank you, sir, very much. I appreciate your testimony. It was excellent.

[The statement follows:]

STATEMENT OF JOHN I.T. MOLONEY, VICE PRESIDENT AND GENERAL MANAGER, ENVIREX, INC., WAUKESHA, WIS., ON BEHALF OF THE WATER AND WASTEWATER EQUIPMENT MANUFACTURERS ASSOCIATION

The Water and Wastewater Equipment Manufacturers Association (WWEMA) is honored to have this opportunity to present its views relative to the fiscal 1988 budget requirements for the Environmental Protection Agency. Our primary involvement in EPA-related activities falls within the water quality and drinking water programs administered by the Agency. Our testimony will therefore be confined to these two program areas.

WWEMA has been in existence since 1908 and acts as the national spokesman for manufacturers serving the nation's municipal wastewater treatment facilities and drinking water utilities. Our members represent corporations which perform extensive research, development and design of technologies used in the treatment of waste and purification of water to ensure a safe and healthy environment for communities, large and small. Our members individually, and as a collective body, strive to provide cost-effective solutions and efficient means for managing water pollution discharges and providing safe drinking water supplies.

It is both a function of the laws set forth by Congress and the regulations administered by the EPA that dictate the level of protection to be given to the nation's water resources. Congress made clear its intentions to protect this vital resource through recent reauthorization of the Clean Water Act and Safe Drinking Water Act. It is now the responsibility of the Congressional Appropriations Committees to provide EPA the necessary tools to properly administer these laws and ensure that these statutory goals are attained. WWEMA members, in turn, will provide technologically-sound methods for achieving these goals.

WWEMA is pleased to offer the following recommendations for funding specific programs within the EPA Office of Water in the coming fiscal year.

WATER QUALITY PROGRAM

The recently enacted Water Quality Act of 1987 provides a comprehensive structure for water pollution control. The Act maintains strict control over the discharge of pollutants from industrial and municipal sources while authorizing new programs to prevent the release of toxic and hazardous pollutants discharged to surface waters.

Construction Grants Program

One major provision of this law provides for a phase-out of the EPA municipal wastewater treatment construction grants program over a ten-year period. Congress clearly stated its intentions to gradually reduce the federal government's role in financing construction of local wastewater treatment facilities as part of its move toward fiscal restraint. WWEMA applauds this decision.

At the same time, Congress recognized that an additional $76 billion is required to satisfy the total needs of treatment facilities with documented water quality or public health problems as determined by the 1986 EPA Needs Survey. In order to satisfy these needs in a fiscally-sound manner, Congress took a bold initiative in authorizing the establishment of state-administered water pollution control revolving funds.

The creation of state revolving funds through a program of capitalization grants to states provides a feasible transition to state and local financing of municipal wastewater treatment facilities. States will be better positioned to assist localities in meeting their existing and future wastewater treatment control needs by providing long-term financial assistance through various forms, to include direct loans, guarantees or insurance for local debt obligations. Repayment of these loans to the state fund is an essential component of the program in assuring the self-sufficiency of states in meeting future needs and in gaining maximum leverage of federal investments in water pollution control efforts.

To support the attainment of this goal and to meet the water quality needs of the nation, Congress authorized $18 billion over a ten-year period for construction of municipal wastewater treatment facilities. Of that amount, $2.4 billion was to be made available for FY 1986 and FY 1987 and an additional $2.4 billion was authorized for FY 1988.

Despite the good intentions of Congress to make firm its commitment to achieve the vital goals of the Clean Water Act, WWEMA submits that these goals will fall far short of their attainment.

When the FY 1987 Concurrent Resolution was approved last October, Congress appropriated $2.4 billion for wastewater treatment grants. However, of that amount, $.6 billion was carried over from the prior year's sum, setting the true FY 1987 appropriation total at $1.8 billion. Congress has released only $1.2 billion for FY 1987 (of which $.6 billion is FY 1986 funds). The remaining $1.2 billion was not released pending final action on the Clean Water Act.

The supplemental appropriations bill currently under consideration in Congress included language to release the remaining $1.2 billion already appropriated for the program in FY 1987. However, when the House voted to approve a 21% across-the-board reduction in the supplemental bill, the construction grants program suffered an additional loss of $253 million. In addition, the supplemental appropriations request for the program failed to address the $600 million carried over from FY 1986 funds.

Finally, with regard to FY 1988 appropriations for the construction grants program, the Administration continues to call for a reduction in funding for the program at a level of $2.0 billion. This is $.4 billion under the amount authorized by Congress in the recently-enacted Water Quality Act.

These actions, if not properly remedied, could underfund the program by over $2.4 billion — this represents a full year of funding needs!

WWEMA urges Congress to either provide for immediate release of the $1.2 billion FY 1987 funds and the $.6 billion in carryover funds, or to increase the FY 1988 appropriations level by such sums. In addition, WWEMA strongly urges the Committee's support to appropriate all of the $2.4 billion authorized for the construction grants program in FY 1988.

According to a survey recently conducted by the Association of State and Interstate Water Pollution Control Administrators, failure to release the remaining FY 1987 funds and to appropriate $2.4 billion in FY 1988 will endanger the ability of over 570 projects in meeting their July 1, 1988 municipal compliance deadline. Full funding at $2.4 billion for FY 1987 and FY 1988 is especially important in light of this municipal compliance deadline. Many cities and counties have established financial plans for compliance based on their position on priority lists to distribute state allocations of $2.4 billion during FY 1987 and FY 1988. Failure to meet this deadline can subject local governments to federal fines and penalties of up to $25,000 per day of violation.

While WWEMA wholeheartedly supports the position that compliance must not be dependent on availability of federal assistance, it seems unconscionable to expect municipalities, which acted in good faith in establishing their compliance schedules based on the reauthorized Clean Water Act, to be penalized for further discrepancies in Congressional support for the program. The Committee's favorable consideration of this request will lend needed stability to the program.

DRINKING WATER PROGRAM

The Safe Drinking Water Act Amendments of 1986 set forth ambitious requirements for the prevention of contaminants in the nation's drinking water supply. Congress firmly established the role of the federal government in setting health-based standards for contaminants in drinking water by requiring the issuance of drinking water regulations for 83 contaminants within a three-year period. Other statutory requirements include promulgation of filtration and disinfection treatment regulations, monitoring for unregulated contaminants, and establishment of new wellhead protection and sole source aquifer programs as part of the Agency's groundwater program initiatives.

In viewing the Administration's FY 1988 budget requests for the EPA Office of Drinking Water, WWEMA is gravely concerned over proposed reductions in the research program, state assistance grants and technical assistance to small water systems.

Research

When hearings were held on proposed amendments to the Safe Drinking Water Act, extensive debate evolved around a congressional proposal to establish tight deadlines for the issuance of numerous drinking water standards. The need for congressionally-mandated deadlines was based on the inability of the EPA to issue regulations for no more than 25 contaminants since passage of the first Drinking Water Act in 1974.

A common concern expressed throughout the proceedings by Agency and industry officials who objected to these schedules was that there lacked "good scientific knowledge" to support the setting of maximum contaminant levels for a majority of substances being proposed for regulation. Congress, in its wisdom, elected to maintain this provision in the new law and directed the EPA Administrator to promulgate standards "...for contaminants which may have an adverse effect on the health of persons and which is known or anticipated to occur in public water systems."

To support the attainment of these statutory deadlines and to ensure the integrity of national drinking water standards, it is imperative that sufficient resources be given to the Agency in conducting health-effects research and for developing toxicological data on the compounds subject to regulation.

The Administration has proposed a reduction of $72,000 in the EPA drinking water research program for FY 1988. This function remains the primary responsibility of the Agency in assuring the attainment of a safe drinking water supply. **WWEMA urges the Committee to give serious consideration to either maintain the current funding level for research at $23.9 million or provide increased funding to ensure that the research needs to support development of scientifically-based standards are met in a timely fashion.**

State Assistance Grants

Forty eight states have primary responsibility for administering the federal drinking water program; the two exceptions being Wyoming and Indiana which have not been delegated primacy by EPA. In these states, the Agency's regional offices carry out the program.

The 1986 Amendments to the Safe Drinking Water Act have resulted in a substantially increased work load placed on the states in enforcing and carrying out the federal standards. During 1988, states will be required to pursue violators of any regulatory requirements by exercising their administrative, civil and criminal enforcement authorities. States will begin implementing the first nine new drinking water regulations; revising their legal authorities to accommodate new maximum contaminant levels; expanding state laboratory certification capabilities; and lending assistance to systems in preparing for the requirements of the Act.

States will further be responsible to determine the need for installing or upgrading filtration processes under the new filtration treatment requirements. States will also be subject to a number of procedural changes ensuing from the Amendments, to include: new public notification requirements; authorities to issue exemptions and variances; and enforcing a ban on lead-content plumbing materials.

The current universe of community water supplies which are monitored and supervised by primacy states exceeds 60,000 systems. Regulations are now under consideration to increase this universe by subjecting approximately 20,000 non-community water systems to these new regulations.

The important role to be served by the states in assuring that the provisions of the revised Safe Drinking Water Act are effectively administered cannot be overstated. Yet the Administration has proposed a $3.8 million reduction in the level authorized for state grants in FY 1988.

WWEMA strongly requests that the Committee approve the full authorization level of $37.2 million for public water system supervision (PWSS) grants in FY 1988.

A recent study conducted by the Association of State Drinking Water Administrators (ASDWA) shows that for only two regulations pertaining to volatile organic chemicals (VOCs) and mandatory filtration, the additional cost to the states to adequately implement these provisions will exceed $20 million per year over a five-year period (FY 1987 through FY 1991). WWEMA's request for $37.2 million in public water system supervision grants is the minimum level needed to support state administration of these ambitious requirements.

Small Systems Technical Assistance

What will likely be the most critical challenge facing the nation in achieving safe drinking water supplies is the ability of small water systems to meet the statutory provisions of the new law. Small systems have the greatest problems with bacteriological and agricultural chemical contamination because of their often rural locations. They rely on shallow wells that are more vulnerable to contamination than the deeper wells or distant reservoirs from which larger systems draw.

According to a recent report conducted by Wade Miller Associates on behalf of the National Council on Public Works Improvement, the public health of citizens served by small water systems is **significantly threatened** due, in part, to the lack of technical expertise of system operators.

Congress recognized the need to provide financial assistance to small public water systems to enable such systems to achieve and maintain compliance with national drinking water regulations by authorizing $10 million per year for FY

1987 through FY 1991. Despite this commitment, the Administration has elected not only to ignore such needs, but to totally eliminate current funding for grassroots training and technical assistance programs to benefit small rural systems, leaving the onus on states to finance such assistance through "use of organizational dues and training fees."

WWEMA finds this position to be incomprehensible and seeks the Committee's support to appropriate in FY 1988 the full $10 million authorized for technical assistance under the Safe Drinking Water Act.

ENFORCEMENT

A primary function of the Environmental Protection Agency in administering the statutory mandates of the Safe Drinking Water Act and Clean Water Act is to provide regulatory oversight of state compliance and enforcement activities, and to perform these activities in non-delegated states.

Congress recognized the inherent relationship between attainment of legislative goals and strong enforcement initiatives when it empowered the Agency with increased authority to take direct action against violators.

Drinking Water Enforcement

The Safe Drinking Water Act streamlined EPA's enforcement procedures by requiring the Agency to take enforcement action whenever a violation is found and a state has not commenced appropriate action. Civil and criminal monetary penalties were raised from $5,000 and $10,000 to $25,000 and $50,000, respectively, per day of violation with additional authority to seek prison terms for criminal violations. These provisions are essential to the program's success given that in 1984 alone, there were over 64,000 reported violations of drinking water standards. Of the approximately 60,000 community water systems, 842 were frequent violators of the microbiological standards in the Act.

To satisfy the enforcement provisions of this law, WWEMA supports the Administration's request for FY 1983 funding of the drinking water enforcement program at a level of $4.2 million.

Clean Water Enforcement

Municipalities will face a major deadline during FY 1988 to achieve compliance with the National Municipal Policy. This policy requires all municipalities to achieve levels of secondary treatment by July 1, 1988 or be placed under a judicially-sanctioned schedule. It is estimated that only approximately 40% of the major municipalities will meet their compliance schedule by the beginning of 1988. Another 30% will meet their schedule during 1988. The remainder are expected to violate their schedule. Enforcement action will be in the form of referrals to the Department of Justice or administrative orders depending on the magnitude of the violation.

The Agency will also focus its attention during FY 1988 in establishing schedules for the approximately 1,000 minor permitees with water quality impact needing construction to meet the statutory deadline. Implementation of the National Municipal Policy must remain the highest priority in the EPA water quality program.

WWEMA supports the Administration's request for FY 1988 funding of the water quality enforcement program at a level of $18.5 million. WWEMA understands that while this funding level represents a decrease of 8.5 total work-

years due to increased automation of EPA's data review process, it will not, in any degree, lessen the Agency's financial commitment to the National Municipal Policy.

CONCLUSION

WWEMA believes that with Congress, EPA, the industry and public interest organizations working together, we will be able to satisfy the future needs of the nation, with continually improving water quality available at a price that is consistent with the benefits. Thank you for your consideration of our comments.

STATEMENT OF DR. WILLIAM T. ENGEL, DIRECTOR, SOUTH CAROLINA ENVIRONMENTAL TRAINING CENTER; ON BEHALF OF THE NATIONAL ENVIRONMENTAL TRAINING ASSOCIATION

Senator PROXMIRE. Our next witness will be Dr. William Engel, director of the South Carolina Environmental Training Center and representing the National Environmental Training Association. Dr. Engel will comment on the need for funding for EPA's Clean Water Act and the Safe Drinking Water Act.

Dr. ENGEL. Thank you very much, Senator. It is a pleasure to be here. As you indicated, I represent the South Carolina Environmental Training Center and am currently president-elect of the National Environmental Training Association.

The National Environmental Training Association represents currently about 800 members around the country who represent the training aspect in water, waste water, and the hazardous waste areas.

OPERATOR TRAINING SHOWS POSITIVE IMPACT

I would first like to thank the committee for the support you continue to show to meet our mutual objectives. The financial support and direction you have provided has made and is making a substantial positive impact on operator training and municipal facilities compliance at the plant and state levels.

It is also having a very positive impact on EPA in its management of these programs. The 104(g)(1) funds that you have provided have been used by the states to bring over 700 small waste water plants back into compliance with many more well on the way. These compliance results have helped significantly to draw state attention and resources to expand and improve operator training programs. NETA has worked with more than half of the states to develop statewide integrated compliance action plans, many of which are now being approved and implemented. states also are continuing to increase their commitment to on-site training and technical assistance to small facilities, with some states voluntarily matching federal 104 funds at the rates of 75 to 100 percent.

Although self-sufficiency is becoming a reality, continued federal funding is still needed. Additional operator training and ONM emphasis must be placed on the use of the add-on section 104 state program grant funds. We understand EPA has issued guidance to states encouraging the use of these funds for an integrated compliance approach, but we also understand very little of these funds will be used for these purposes.

We urge the committee to reinforce its guidance in the 1988 committee report and to target $2 million specifically for the state implementation of training and technical assistance programs. We are even more pleased to learn that EPA has requested $800,000 in 1988 for operator training. More than the money itself, we believe that the request indicates the agency has accepted that operator training is a need, not an option, in an effective compliance policy.

We ask the committee to add $1 million to this request to maintain the funding at the current 1987 level. The combined strategy of on-site training and technical assistance is working extremely well. While there are continued needs being identified, the benefits are substantially greater than the cost.

WATER PROGRAM MODEL

The water program model is now being effectively transferred to the RCRA Program. Responding to your directive and add-on appropriations, we are undertaking a RCRA integrated training approach which involves technical assistance, an outreach program, and state program development.

The goal of this initiative is to improve facility compliance through training and on-site technical assistance. To achieve this goal, training and technical assistance should be integrated with other compliance oriented functions, and these programs should lead to eventual institutionalization.

Fifteen states will be selected to participate in this initiative, which will be based on an integrated compliance strategy. The first objective is achieved by developing the state training action plans. The second objective would be attained by instituting this outreach training and technical assistance program. Since the RCRA-initiated program is just beginning, we do not recommend any changes in that program for the next fiscal year. It does appear that there is a need for better coordination in the RCRA, the CERCLA, and the SARA programs. We recommend this committee report to Congress on those training activities and how they will be integrated with the state training action plans.

Last but not least is the availability and the quality of our drinking water, as we have heard this morning. It has been receiving increased national attention, and what we are asking for and looking at is the current program in the RCRA and the waste water, the cost effectiveness of this program. We are urging the committee to provide guidance and funding to EPA to undertake a similar effort.

We would recommend that the committee provide $500,000 add-on funds for conducting a national evaluation of training and technical assistance in the 50 states for developing elements of quality training that would lead to the development of state training action plans in drinking water.

The National Environmental Training Association appreciates this opportunity to provide testimony on behalf of the environmental training profession and thanks the committee for its past support of operator training.

Senator PROXMIRE. Thank you, Dr. Engel.

[The statement follows:]

STATEMENT OF DR. WILLIAM T. ENGEL, DIRECTOR, SOUTH CAROLINA ENVIRONMENTAL TRAINING CENTER, ON BEHALF OF NATIONAL ENVIRONMENTAL TRAINING ASSOCIATION

INTRODUCTION

This testimony is presented on behalf of the National Environmental Training Association (NETA) in recognition of the need for a national commitment to the development of a competent environmental workforce. This testimony summarizes the current status of training capabilities (including an overview of what has been accomplished with previous Federal apropriations) and presents recommendations for program direction and future appropriations.

NETA is a not-for-profit association of professional environmental trainers and is supported primarily by member dues, grants, publications and training activities. An environmental trainer provides vocational instruction, technical assistance, or employee training in environmental control and regulations. Environmental trainers are employed by educational institutions (universities, community colleges and state training centers), local/state/federal government, private sector industry, and consulting firms.

The national response to growing environmental pollution in recent decades has been primarily an effort to develop standards and regulate the flow of pollution into our air, streams and soil. Vast expenditures have been made on technology and facilities to process and contain contaminants. The federal government has assumed the major role and responsibility for developing regulations and assisting states to build facilities, particularly water and wastewater treatment plants. As the environmental control field has matured it has become increasingly evident that human resource development is an integral component in the fight against environmental pollution.

Congress has recognized the need for trained personnel on the Federal, State and local level to permit, regulate, maintain and operate pollution control facilities and systems and increasingly, in the last decades it has supported projects to train pollution control personnel.

It has, furthermore, been the will and mandate of the Congress that eventual responsibility for environmental control lay with the state governments. We are currently in a transition phase from a federal developmental regulatory stage to a state regulatory implementation stage. This phase requires an intensified effort to train personnel at the state and local level to understand, accept and implement this responsibility.

The current emphasis is and should continue to be a commitment to assist state government agencies to develop State Training Action Plans to provide and maintain an adequate environmental workforce.

TRAINING & TECHNICAL ASSISTANCE TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

The financial support and direction you have provided has made and is making a substantial positive impact on operator training and municipal facilities compliance at the plant and state levels. It is also having a very positive impact on EPA and its management of these programs. The 104(g)(1) funds you have provided have been used by states to bring over 700 small plants back into compliance with many more well on the way. These compliance results have helped significantly to draw state attention and resources to expand and improve operator training programs. NETA has worked with more than half of the states to develop Statewide Integrated Compliance Action Plans, many of which are now being approved and implemented. States are also continuing to increase their commitment to onsite training and technical assistance to small facilities with some states voluntarily matching federal 104(g)(1) funds at rates of 75 to over 100 percent.

Although self-sufficiency is becoming a reality, continued federal funding is still needed. Additional operator training and O & M emphasis must be placed on use of the add-on section 106 state program grant funds. EPA has issued guidance to states encouraging use of these funds for integrated compliance approaches, but it appears that very little of these funds, if any, are being used for these purposes.

We are pleased to learn that EPA has requested $800,000 in 1988 for operator training. More than the money itself, we believe that the request indicates that the Agency has accepted operator training as a need, not an option, in an effective compliance policy. This is a major step toward institutionalizing training and technical assistance in EPA's programs.

RCRA INTEGRATED TRAINING INITIATIVE

In Fiscal Year 1987, the U.S. Congress issued a directive and provided an add-on appropriation " to undertake a concerted RCRA training initiative" using the "model for operator training developed and proven in the water program, which integrates technical assistance, outreach activities, and state program development."

Recognizing that traditional RCRA program approaches to workforce development would have to be dramatically broadened and expanded to meet the ever increasing and more complex hazardous waste program needs, EPA embraced the concept of a RCRA Integrated Training Initiative (RITI). The Initiative will be modeled after the operator training program developed and proven in the water program.

The goal of the RITI is to improve facility compliance through training and onsite technical assistance. To achieve that goal, training and technical assistance should be integrated with the other compliance-oriented functions of the State regulatory agency, and become institutionalized. There are, therefore, two primary objectives for the Initiative and they will be pursued in two parallel tracks:

1. Build a stronger state commitment to and capability for training and technical assistance.
2. Demonstrate that training and technical assistance, as compliance tools, can improve hazardous waste management and enchance environmental quality.

The first objective will be achieved by developing and implementing **State Training Action Plans (STAPs)**, which will provide a blueprint to each State for programmatically sound and fiscally self-sufficient training and technical assistance programs.

The second objective will be accomplished by instituting an **"Outreach Training and Technical Assistance Demonstration Project** primarily targeted toward the regulated community. The program will provide the necessary human and material resources to achieve and sustain compliance.

Fifteen states will be selected to participate in the Initiative which will be based on an **Integrated Compliance Strategy (ICS)** The ICS Concept proposes that training and technical assistance are tools which can be used effectively to achieve compliance in addition to or in lieu of formal enforcement action. Such an approach requires a working relationship between the regulatory staff, the educational institutions, and the private sector.

At the conclusion of Initiative, fifteen states will have an established ICS which is facilitating compliance and a STAP which provides the states with a blueprint to develop a competent workforce. In addition, all fifty states will have access to a model approach which has potential application in other areas of the hazardous waste program.

PROGRAM RECOMMENDATIONS

Clean Water Act

While we generally support the gradual reduction of funding we have seen over the past three years, **we urge the Committee to provide guidance and funds to permit EPA and States to expand the onsite program further into other small plants that have not been addressed under the current program.** Supporting the National Municipal Policy and NPDES compliance, EPA has focused funds on achieving effluent compliance by minor facilities tha discharge to navigable waters. There are several thousand small treatment plants, however, that discharge to land or groundwater and lagoons that may discharge only a few times annually. These plants are not a national priority for onsite assistance or training now, but they have significant compliance problems and training needs that could be helped through this program.

RCRA/CERCLA

The RCRA Integrated Training Initiative is just beginning to be implemented. We do not, therefore, recommend any changes to that program at this time. It appears, however, that there is a need for better coordination between the RCRA/CERCLA/SARA program offices in EPA in terms of program priorities and funding of training activities.

We recommend that the Committee directs EPA to report to Congress on the training activities of CERCLA/SARA; how they are integrated with the RCRA Integrated Training Initiative; and how they will incorporate the Integrated Compliance Strategy and State Training Action Plans already used by Office of Water and OSWER.

Safe Drinking Water Act

The availability and quality of drinking water has been receiving increasing national attention. The periodic alarming reports about harmful substances present in many of the public and private water supplies across the nation indicate either a complacent water utility workforce, or one which lacks the proper skills and knowledge to provide adequate treatment.

Given the success and cost-effectiveness of the training and technical assistance efforts of the Integrated Compliance Strategy, and the State Training Action Plans in the wastewater field, **we strongly urge the Committee to provide guidance and funding to EPA to undertake a similar effort in the drinking water programs.**

FUNDING RECOMMENDATIONS

The combined strategy of onsite training and technical assistance, and State program development is working exceptionally well. While there are continuing needs that are being identified, the benefits are substantially greater than the costs. To that end, the National Environmental Trainig Associaton recommends the following federal appropriation levels to support the environmental training goals and Integrated Compliance Strategy recommended herein:

Clean Water Act

Section	Amount	Purpose
104(g)(7)	$1,000,000	(1) To continue the current onsite technical assistance program and expand it to other small treatment plants which discharge to land or groundwater, and lagoons that may discharge only a few times annually. (2) Continue and expand the Integrated Compliance Strategy and State Training Action Plans to cover all fifty states.
106	$2,000,000	For State implementation of training and technical assistance programs. This would be a major step toward institutionalizing training at the State level. The Committee should reinforce its guidance to EPA in the 1988 Committee Report for the use of the funds.

RCRA/CERCLA/SARA

No funding requested at this time

Safe Drinking Water Act

$500,000	For conducting a National Evaluation of Training and Technical Assistance in all fifty states and developing elements of Quality Training which will lead to an Integrated Compliance Strategy and the development of State Training Action Plans

The National Environmental Training Associaton appreciates this opportunity to provide Testimony on behalf of the environmental training profession.

STATEMENT OF ROXANNE BRADSHAW, SECRETARY-TREASURER, NATIONAL EDUCATION ASSOCIATION

ACCOMPANIED BY JOEL PACKER, NATIONAL EDUCATION ASSOCIATION

CANCER-CAUSING ASBESTOS

Senator PROXMIRE. Our next witness is Roxanne Bradshaw, secretary-treasurer of the National Education Association.

Ms. Bradshaw?

Ms. BRADSHAW. Thank you very much, Chairman Proxmire. I am Roxanne Bradshaw. I am the secretary-treasurer of the National Education Association, which represents 1.8 million members across this country. I appreciate the opportunity to speak to you on a serious threat to our nation's students and school employees. The testimony we have submitted to you for the record is endorsed by 23 national education, labor, and health organizations.

We are grateful for Congress' past efforts to help eliminate the threat of cancer-causing asbestos. Progress in this area would not have been possible without federal assistance. And yet, sadly, for the affected schoolchildren, Congress has never appropriated the full amounts authorized under the Asbestos School Hazard Abatement Act. Federal assistance to date amounts to only 3.8 percent of the total cleanup costs.

We cannot delay any longer. Even now as many as 16.5 million students and school employees are exposed daily to asbestos.

The President's fiscal year 1988 proposed budget calls for complete elimination of ASHA funds. This proposal is fiscally short-sighted and morally reprehensible. We urge this committee's support for a fiscal year 1988 ASHA appropriation that fully meets the total $125 million authorization level for fiscal year 1988.

As of October 1987, compliance with the Asbestos Hazard Emergency Response Act will be required of all schools. AHERA is necessary to ensure that asbestos inspection and abatement is conducted safely and thoroughly, but school districts with limited resources will have an even greater need for Federal assistance to comply with AHERA.

NEED OUTWEIGHS FUNDS

Despite Congress' support, local needs far outweigh available funds. In 4 years, EPA provided $126 million to about 1,300 schools, 17 percent of the requests. EPA estimates that total asbestos cleanup will cost $3.2 billion. state and local governments alone cannot fully meet the needs. Recipients of ASHA assistance are those with the greatest financial need, and EPA has set even more rigorous fiscal criteria for fiscal year 1987 grants and loans.

The bulk of funds awarded in this program must be repaid to the new asbestos trust fund. Funds in this trust will be made available to continue asbestos cleanup.

Finally, we urge the subcommittee to direct EPA to distribute applications for ASHA monies no later than December 1, 1987, and to announce awards to schools no later than April 15, 1988. ASHA awards have never been announced until June or July and, for safety's sake, abatement work must be performed when students are not in the building. School districts need time to let bids, hire contractors, and vote on disbursal of funds.

Congress has made a good beginning on this, but the work is far from being over at this time. We urge this committee to support full funding and ensure that EPA expedites the application process so that local education agencies can eliminate this threat as quickly as possible.

Senator PROXMIRE. Thank you, Ms. Bradshaw. Your indignation is absolutely appropriate. There is no question that the lives of our children are the most precious thing that we could preserve, and that has to be our No. 1 value.

I hate to repeat it, but it is a fact of life: We do have to find the money. You may know that this committee recommended an increase in administrative expenses cap for this program in the supplemental appropriation bill. That increase may permit an acceleration in the program, but I wish you would address yourself just for a minute or so to whether or not it can be accelerated effectively. Are you confident that EPA could do an adequate job of preparing for the flood of applications that it would be certain to receive?

Ms. BRADSHAW. I think they are capable of handling that. I think that the major problem has been that, in the past, they have never released those applications in a timely manner, and that has created problems for the local school districts. And I guess I share the concern that it is not a matter of can they handle the applications coming in, but are they willing to release those early enough that they then have the time lines that will allow them to deal with it?

Mr. PACKER. If I could just add one thing?

Senator PROXMIRE. Yes, sir.

REMARKS OF JOEL PACKER

Mr. PACKER. My name is Joel Packer. I am a staff member with NEA. The particular problem this past fiscal year was that, because the administration requested a rescission of 1987 funds, which the Congress rejected, OMB essentially did not allow EPA to send out applications. And what we are asking is if the Appropriations Committee could direct EPA to distribute applications so that, even if a rescission next year would be requested, at least schools could be preparing the applications.

And then if a rescission were to be rejected by Congress, EPA could have the process already underway, rather than waiting until this year to distribute applications and give schools only about 2 or 3 weeks to fill them out.

Senator PROXMIRE. Thank you very much.

[The statement follows:]

STATEMENT OF ROXANNE BRADSHAW, SECRETARY-TREASURER, NATIONAL EDUCATION ASSOCIATION

Mr. Chairman and Members of the Committee:

I am Roxanne Bradshaw, secretary-treasurer of the 1.8 million-member National Education Association. Our members are America's elementary, secondary, and vocational school teachers and school employees, postsecondary faculty and staff.

This statement is endorsed by the following organizations: Alice Hamilton Occupational Health Center, American Academy of Pediatrics, American Association of School Administrators, American Federation of State, County and Municipal Employees, American Federation of Teachers, American Public Health Association, California State Department of Education, Children's Defense Fund, Council for American Private Education, Council of Chief State School Officers, Council of Great City Schools, National Association of Elementary School Principals, National Association of Secondary School Principals, National Congress of Parents and Teachers (PTA), National School Boards Association, New York City Board of Education, New York State Department of Education, Service Employees International Union, Sheetmetal Workers International Association, United States Conference of Local Health Officers, United States Conference of Mayors, United States Public Interest Research Group, and White Lung Association.

I am pleased to have this opportunity to speak to you today on a matter concerning a most serious threat to the lives and health of many our nation's students and school employees.

NEA has testified many times before Congress on the hazard of asbestos and the substantial need for federal assistance in eliminating this hazard in school buildings throughout the nation. Even now, as many as 1.5 million school employees and 15 million school children are exposed to cancer-causing asbestos every day.

We are grateful for Congress' support for asbestos abatement assistance over the past four years. Congress has shown consistent, bipartisan support for programs, protections, and funding to eliminate the threat of cancer-causing asbestos. But unfortunately for our nation's schoolchildren, Congress has never appropriated the full amounts authorized under the Asbestos School Hazard Abatement Act.

Moreover, the question of federal assistance for asbestos abatement has been -- at times -- a political football, kicked around in policy debates between the Administration and Congress over the appropriate role for federal, state, and local governments in eradicating the danger of asbestos exposure. The Administration's recalcitrance on asbestos issues has brought about numerous delays, perpetuating asbestos hazards in our nation's schools.

Mr. Chairman, the hazards of asbestos exposure to children and school employees are far from eradicated. It is imperative that all levels of the government cooperate to do what is necessary to protect our nation's children and youth. It is therefore vital that this Committee support and that Congress enact appropriations for the Asbestos School Hazard Abatement Act for FY88 that fully meets the $125 million FY88 authorization level for this program.

The President's proposed budget for FY88 calls for complete elimination of funds for ASHAA, arguing that this issue is a state and local responsibility. In fact, state and local governments have made significant efforts in recent years to contain or remove hazardous asbestos. But the progress made in asbestos abatement in the schools would not have been possible without the guidance and assistance of the federal government. And the eradication of this danger will not be possible without continued federal assistance.

The Administration's proposal to totally eliminate funding for this program shows a callous disregard for the lives of millions of school children and of school employees. To eliminate funding for ASHAA would be both fiscally shortsighted and morally reprehensible. It is essential that we continue — indeed, increase — our investment in human health by fully funding the Asbestos School Hazard Abatement Act.

Beginning in October 1987 compliance with the Asbestos Hazard Emergency Response Act of 1986 (AHERA/P.L. 99-519) will be required of virtually all schools. These regulations, which NEA supported, are necessary to ensure that asbestos inspections are conducted thoroughly and abatement projects are conducted safely. But carrying out responsible abatement projects is generally more expensive than a haphazard approach. All schools will be required to perform inspections, develop an asbestos management plan, and take appropriate response actions.

Local school districts that were hard-pressed to find the funds for abatement projects of any kind will have an even greater need for federal assistance to fund inspection and abatement projects employing accredited personnel and in compliance with these essential regulations. For those areas which need assistance, AHERA allows up to 10 percent of ASHAA funds to be used for grants to state or local education agencies for inspection and preparation of management plans.

We cannot, as a nation, afford to postpone the clean-up of asbestos in the schools any longer. Delays brought on by the initial ignorance of the hazards of asbestos, lack of resources at the local and state level, footdragging by federal agencies, and other obstacles only perpetuate the threat to America's children.

ASHAA Award History

For the past three years, Congress has demonstrated a clear bipartisan commitment to assist local school districts in removing the threat of abestos. In June 1985, the EPA offered the first $45 million in assistance to public and private schools to finance asbestos abatement projects. In late July 1986, the EPA provided an additional $47 million in assistance. In March of this year, EPA announced it would award the bulk of the FY87 grants and loans, $34 million, to priority unfunded FY86 ASHAA applicants.

EPA is now taking applications for the remaining funds, between $10 and $12 million, for distribution to schools in May 1987.

In the first two years, EPA has received a total of 1,470 applications from local education agencies requesting $741 million in abatement funds for 6,872 individual schools. However, EPA has provided only $126 million to about 1,300 schools. The funding has met only about 17 percent of requests.

The states receiving the largest awards in FY87 were Ohio, $6.2 million; Massachusetts, $4.3 million; Michigan, $2.8 million, New Jersey, $2.7 million; and Illinois, $2.6 million. Awards for other selected states were Louisiana, $657,000; Iowa, $522,000; New York, $451,000; Mississippi, $406,000; Wisconsin, $342,000; Maryland, $332,000; Vermont, $62,000; and New Mexico, $5,775.

Needs Remain Great

The need for federal assistance to undertake asbestos abatement continues to far outweigh available funds. A recent survey of asbestos in school buildings — conducted by NEA in February 1986 — showed that three-quarters of all school districts in the nation have at least one building with friable asbestos. A General Accounting Office report in March 1985 found asbestos in more than half of the 4,062 schools visited. EPA recently estimated that the total costs of asbestos clean-up in adherence with AHERA regulations will be some $3.2 billion over a period of years.

State and local governments have made serious efforts to provide the necessary resources to remove or contain hazardous asbestos. But state and local governments alone cannot fully meet the needs in this area. Constitutional or statutory restraints on revenue and spending have hamstrung many state and local officials responsible for public education. Slow economic growth, high unemployment, and setbacks in states whose economies are grounded in agriculture, energy, and manufacturing are among the obstacles state and local officials encounter in trying to address the threat of asbestos. The National Association of State Budget Officers reports that 23 states have been forced to cut their FY87 budgets, up from 13 states in FY86.

States and localities have had to assume an ever greater responsibility for a wide range of programs and services that the federal government once supported, including education programs. Federal aid to state and local governments as a percentage of the federal budget has fallen from around 16 percent in FY80 to around 10 percent in FY87.

Moreover, local school agencies applying for ASHAA grants and loans are those with the greatest financial need. EPA reported that 80 percent of the projects funded in the ASHAA program were in school districts where the per capita income is less than $7,500 — 65 percent of the national average, and more than one-third were in school districts where the per capita income is less than $6,000 — or about 50 percent of the national average.

EPA has established even more rigorous criteria for consideration of grants and loans for FY87 funds.

Furthermore, it must be well understood that only the poorest school districts are eligible for outright grants. The bulk of funds awarded in this program are for loans which would be repaid to the Asbestos Trust Fund established under AHERA. Under the provisions of the Asbestos Trust Fund, repayments of loans under ASHAA and any penalties assessed against local education agencies under AHERA will be made available, subject to appropriations, for the purpose of carrying out the ASHAA program. AHERA authorizes $25 million per year for FY87-90 as repayable advances to the Asbestos Trust Fund.

Timing of Applications

One area where ASHAA could be greatly improved is in the timelines for distribution of applications and announcement of awards to schools. In order to minimize exposure to asbestos fibers released in the air during actions to remove or contain abestos, it is essential that major abatement work be performed when students are not present in the buildings. Obviously, summer is the best time to do this.

EPA staff have themselves stated that schools should be notified of awards by April so they can take the necessary steps to let bids, hire a contractor, and take appropriate governance actions to proceed with abatement work in the summer months. However, in FY86 awards were not announced until July 1986. And in FY87, because of the President's requested recission, the applications were not even distributed to schools until April 1987, and award notices will not be made until June.

To avoid these problems, we recommend that the Committee add a provision to the appropriations bill directing EPA to distribute applications to school districts no later than December 1, 1987, and to announce awards to schools no later than April 15, 1988.

Conclusion

Each year it seems there are new discoveries of health hazards in our environment. And while each deserves appropriate attention and action, we cannot jump from problem to problem. Many of these problems, such as asbestos, require a sustained high level of activity until solutions are found and the contaminants are eradicated. Congress has made a good beginning in dealing with the hazards of asbestos in the schools. But the work is not completed.

We urge this committee to support full funding of the ASHAA program and take steps to ensure that EPA carries out the application process in a timely manner so that local education agencies can eliminate this threat as quickly as possible.

Thank you.

STATEMENT OF DR. LEONARD WEINSTEIN, CORNELL UNIVERSITY, ON BEHALF OF THE NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND GRANT COLLEGES

ENVIRONMENTAL RESEARCH FUNDING

Our next witness is Dr. Leonard Weinstein of Cornell University, and Dr. Robert Kohut also of Cornell, for the National Association of state Universities and Land Grant Colleges.

Dr. WEINSTEIN. Thank you, Mr. Chairman. I am Dr. Leonard Weinstein. Dr. Kohut had an ear infection, so he didn't come.

As you mentioned, I am representing the National Association of state Universities and Land Grant Colleges, which represents 149 major universities and colleges. I am here to discuss the EPA budget and to put in a plea for long-term funding for environmental research. In 1977, the National Academy of Sciences identified three areas of research for EPA. One of these was research to support decisionmaking; the second was to support anticipated environmental problems; and the third was to support research and advanced fundamental knowledge.

The interest in EPA is about decreases, actually, as I go down the list, and it is understandable that their greatest interest would be in decisionmaking and the solving of problems, but there is a need for fundamental knowledge. Otherwise, the other areas of research don't work.

NATIONAL CROP LOSS ASSESSMENT NETWORK

I would like to just summarize for you a program that EPA did support that was long-term research and that I think was very successful, and it was called the National Crop Loss Assessment Network, which began in 1980 and is finishing up this year. So, we have had 7 or 8 consecutive years of research, among five universities distributed throughout the United States. The purpose was to decide or determine what the losses were to agriculture from ambient pollution today in this country. Because of budget cuts and so on, the scope of the program was reduced to one pollutant, ozone, which was a fortunate selection, and we dropped all of our secondary objectives, that is looking at combinations of pollutants that occur together and other aspects of the problem.

We looked only at six crops because funds were reduced again. So, we looked only at the six major commodity crops of this country. At the end of this, an econometric model was fitted to the data, and the following results have been obtained.

In 1980, the level of ozone—not 1987, but 1980 level of ozone—reduced crops about $1.8 billion. If the level of ozone were increased 25 percent over 1980, which probably brings it around where it is today, the cost to the consumer is somewhere around $2.1 billion. If you convert that into 1988 dollars, or 1987 dollars, it would probably be close to $3 billion that is lost in six crops. This does not include all of the crops of the Central Valley of California. It does not include apples, and it doesn't include grapes and so on and so forth.

So, I just think this is a very important point, and it came out of a long-term research project. At the present time, EPA has research in cooperation with the U.S. Forest Service on forest decline or acid rain destruction of forests, if you will. Most people don't believe it is acid rain destruction of forests. It is probably ozone, a major contributor again, but the funding for this project is being given in 2-year sections, that is support for 2 years. And this is a problem that took perhaps one or two generations to occur, and scientists are expected to solve the problem in 2 years, with the possibility of a third year of funding. This is not the way fundamental research should be conducted, and I believe that someone should revise the program and look at the longer term funding for people doing research.

You have to understand that EPA is the only agency that environmental scientists really have to go to because most of the other agencies, like the National Science Foundation, don't deal with air pollution.

COMPETITIVE GRANTS PROGRAM

The Competitive Grants Program, I understand, this year at EPA is scheduled at $8 million. In 1981, it was scheduled for $22 million, a drop of threefold. And this is incomprehensible to us in the university system that the problems are growing—we have problems of water, air, forests, you name it—and the funding for research is going down.

Thank you very much for your time, and I will be happy to answer any questions.

Senator PROXMIRE. The problem is a problem I have to keep repeating over and over again, but where are the moneys coming from?

Dr. WEINSTEIN. It is a question of redistribution of funds, I think, within the agency.

Senator PROXMIRE. We would love to have you give us some specific areas where we could cut and transfer funds. That would be fine.

Dr. WEINSTEIN. What I am concerned about—if you don't mind my saying this—is that I heard yesterday with the salary increases and the—if that is true—and I am told it is—that means that everyone in R&D has to take a proportional cut to support the salary increase. That is a very difficult situation, and it means that even the $8 million proposed for the Competitive Grants Program will have to take a cut.

Senator PROXMIRE. How would you handle it?

Dr. WEINSTEIN. I have no idea how to handle it. I would take it out of the total agency, not necessarily out of research and development. I just feel that R&D is not held in the highest esteem within the federal government or within the Agency in terms of these kinds of problems; and yet, if these problems don't have basic research—fundamental research—on which to build answers, they are just going to continue to get worse.

And I think the situation is obvious today.

Senator PROXMIRE. Thank you, sir. That is very, very helpful.

[The statement follows:]

STATEMENT OF DR. LEONARD H. WEINSTEIN, PROGRAM DIRECTOR, ENVIRONMENTAL BIOLOGY, WILLIAM BOYCE THOMPSON DISTINGUISHED SCIENTIST AND ADJUNCT PROFESSOR, DEPARTMENT OF NATURAL RESOURCES, CORNELL UNIVERSITY, AND DR. ROBERT J. KOHUT, PLANT PATHOLOGIST, BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, CORNELL UNIVERSITY

I am Leonard H. Weinstein, William Boyce Thompson Distinguished Scientist, Program Director for Environmental Biology at Boyce Thompson Institute for Plant Research and Adjunct Professor of Natural Resources at Cornell University.

I have been involved in research on the effects of atmospheric pollutants on plants for 25 years. I presently direct a group of scientists who are conducting research on plants of ozone, sulfur oxides, nitrogen oxides, acidic rain, airborne particles, and fluorides.

My co-author is Robert J. Kohut, Plant Pathologist at the Boyce Thompson Institute for Plant Research at Cornell University. He has been involved in air pollution research for more than 12 years and has conducted research to assess the effects of ozone, PAN, sulfur dioxide, and hydrogen fluoride on trees and agricultural crops. He is the Principal Investigator for the National Crop Loss Assessment Network (NCLAN) research program at the Boyce Thompson Institute.

The purpose of this testimony is to comment on the impact of acid rain, ozone and other pollutants on the productivity of crops and forests.

In 1977, the National Academy of Sciences reported to the U. S. EPA the findings of their study entitled: "Research and Development in the EPA". The report described the role that research and development should play within EPA and how EPA might obtain the scientific and technical information they need to support their mission. The Academy identified three objectives for research by EPA: (1) research to directly support decision making, (2) research to anticipate environmental problems, and (3) research to advance fundamental analysis of environmental processes that is not supported by other agencies. The ever-increasing urgency of environmental problems and limited resources for support of research has forced EPA to commit a major share of these resources to the first goal, that of conducting research to directly support decision making. Only limited resources have been committed to the second and third goals. During the last ten years, it appears that EPA's support of research on emerging environmental problems and research to advance fundamental knowledge of environmental processes has suffered. This is a serious problem that should be considered in the EPA budget development process.

In recent years, EPA has shifted the awarding of research funds from grants to cooperative agreements and contracts in order to have more control of specific objectives, schedules, and procedures for the support of mission-oriented research. But grants are useful for support of longer-term, fundamental research because they allow flexibility and encourage initiative, creativity, and originality. The shift away from research grants and lack of funds for fundamental research leaves us with serious gaps in our basic understanding of environmental processes that is needed to support and improve the credibility of mission-oriented research. This problem was recognized in 1977 when the Academy report stated that: "EPA has consistently felt unable to sustain certain important research programs, especially those... that require a stable, long-term commitment of resources. In this category are programs conducted to anticipate future environmental problems or to advance fundamental scientific understanding, as well as some programs that have direct bearing on decision making, but need a

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Request for extramural EPA funds:

1) $2 million for additional research on the interactions of air pollutants and other stresses on agricultural crops

2) $10 million for the Competitive Grants Program

long time, such as environmental epidemiology." During the last ten years, these deficiencies have become more serious and support the Academy suggestion that provision be made through the budgetary process to provide a wider base of support within EPA for long-term, fundamental research on environmental issues.

Two programs can be used to illustrate the importance of long-term research; the first is the EPA-sponsored National Crop Loss Assessment Network (NCLAN), a successful program that is drawing to a close, and the second is the recently initiated EPA/U.S. Forest Service cooperative research effort in forest decline (the so-called acid rain/ forest program) that is still under development. The NCLAN program was initiated in 1980 as a long-term study to define the relationships between the yields of major agricultural crops and the major air pollutants, ozone, sulfur dioxide, and nitrogen dioxide, and their mixtures. The results are being used to provide an economic assessment of air pollution-induced crop loss and to support the development and/or review of National Ambient Air Quality Standards. At its inception, the program was designed to advance the understanding of cause-and-effect relationships that determine crop response to air pollutants. Secondary objectives included assessing the interaction of pollutants with other stresses important in agriculture such as drought, diseases, and insects. Early in the program, a lack of funds forced EPA to redirect the research to focus only on ozone, and there has been little research with other important pollutants or their combinations. Despite elimination of many of the original primary objectives and all of the secondary objectives of NCLAN because of reduced funding, the program has been successful. Why? Because it has been a long-term (7-year) study coordinating and integrating the research activities of scientists from many disciplines both at the EPA laboratory at Corvallis and at the four research sites at North Carolina State University, Argonne National Laboratory, the University of California at Riverside, and the Boyce Thompson Institute at Cornell University. NCLAN's first economic estimates indicate that the benefits that would accrue if the level of ozone was reduced only 25% below that of 1980 for corn, soybean, wheat, cotton, barley, and grain sorghum would be $1.8 billion, and if the ozone level were raised 25% it would cost the consumer $2.1 billion (in 1980 dollars). These are only preliminary estimates, but they are based on sound econometric principles. They do not, however, include the regional losses that would be sustained with many other crops, such as grapes and vegetable crops in California, apples in New York, or citrus crops in Florida, which, although small in national terms, can be devastating to local economies. Few, if any, of these crops have been studied nor is there any immediate plan to continue the NCLAN program to do so. Even though ozone produces these losses, there may also be hidden costs of production associated with ozone exposure, such as the need for increased use of fertilizer, pesticides, water, etc.

The second research program addresses the unexplained decline of forests of eastern North America. The decline is most notable in spruce and fir although a number of other species, including sugar maple and several species of pines, have also been reported to be affected. In areas where this problem exists, there is decreased growth and increased mortality of forest trees, and their natural cycle of regeneration has been disrupted. One of the reasons proposed for this decline is that the development of fossil fuels for energy, transportation, and industrial production has produced primary air pollutants which have led to the formation of acid rain. But the relationship between acid rain and long-term decline of forests in areas of the U.S., Canada, and Europe is poorly understood and is highly controversial. Perhaps acid rain is one cause of the forest decline problem, but it is certainly not the only one, and the long-term effects of ozone and other airborne contaminants, drought, and other environmental stresses appear to be associated with the problem also. On the one hand, there is evidence that acid rain in its present composition and degree of acidity may have no effects, or even beneficial effects, on certain forests. On the other hand, acid rain may be responsible for long-term detrimental effects on forests of not only eastern North America, but also Europe. In 1983 testimony to this Senate Committee by NASULGC, we stated that "....we can presume that acid rain is a principal cause of the problem, but we should not ignore the long-term effects of ozone and the possibility of its combined effects with acid rain and other stresses". Today, four years later, we can be even more certain of the detrimental effects of ozone on forest health.

As presently constituted, contract awards from EPA/U.S. Forest Service initiatives to study the decline of forests appear to have a two-year life span. A problem that took perhaps one or more generations to evolve, considering the complexities of forest ecosystems, can in two years only begin to suggest the most profitable directions for a long-term research program. Even if these two-year awards are renewed as a series of one-year extensions, this places significant constraints on the investigator because of problems in long-range planning. Since these renewals are uncertain, all planning must be done in 1-year increments resulting in unnecessary disruptions in program continuity and inefficient use of funds. Clearly the nature of the problem demands the adoption of a more long-term approach to research. The factors responsible for inducing the decline may be producing minor annual perturbations whose additive or multiplicative effects over several years become highly deleterious. Assessment of these effects requires the implementation of a research approach that acknowledges that time is a critical experimental factor. Unlike the

NCLAN program whose work with annual crops allowed the production of definitive annual research products, the annual products of the forest decline studies will be more open-ended. Over time, these products will begin to integrate results and draw conclusions about the responses of trees and ecosystems to the pollutant stresses being assessed. Adoption of a long-term approach to research can expedite this process.

In the case of crop productivity, acid rain appears to have little effect, and in its present composition, may even be beneficial to some plants through a 'fertilizing' effect of the nitrogen in the rain. Perhaps the greatest concern with acid rain on crops is in the premature removal of applied pesticides, resulting either in a greater incidence of severity of pests or in increased costs due to more frequent application of pest control chemicals.

Another means of acquiring data on long-term effects of pollution is by providing a reasonable level of funding to the EPA Competitive Grants program. The program represents one of the most important of the EPA-university links and provides the opportunity for EPA to gain an understanding of the basic processes associated with pollution-related environmental stresses. This need is not fulfilled by the NSF, NIH, or NIEHS programs because pollution-directed research does not fall within their areas of support and has even been specifically excluded in some cases.

In testimony before this Committee in 1985, NASULGC summarized the allocation of funds to EPA's Office of Research and Development over a number of years. In a comparison of the budget for 1981 with that proposed for 1988 for Competitive Grants (not including $3 million earmarked for Superfund research), there is a decrease of nearly 3-fold in actual dollars ($22 million vs. $8 million) or 4-fold in 1988 constant dollars ($32 million vs. $8 million). The financial obligation to support approved grants for their second year would leave about $1.8 million for new grant support in 1988. At an average annual cost of about $84 thousand per grant, the Competitive Grants Office can award only 21 new grants. As the problems grow, the level of funding seems to decrease. Clearly, the proposed level of funding for 1988 is inadequate and cannot support a long-term program of innovative research, especially when it is distributed among 5 fields of investigation.

How can an agency like EPA properly fulfill its mandates? Certainly they cannot be accomplished without an understanding of basic and applied environmental processes ranging from atmospheric chemistry, to transport, deposition, and ecological effects. Increased support for long-term basic and applied research will not only improve our understanding of the problems posed by acid rain and forest decline or crop losses due to ozone, but will also provide a reservoir of information in many scientific disciplines that can be used to accomplish EPA's mandates and to assist Congress in its guidance of what EPA's goals and methods should be. The existence of stable, long-range research programs at our university and research institutes will provide the future manpower needs not only for EPA, but for this nation's industries. Scientists trained in these programs will have the capacity to prevent or solve environmental problems before we blunder into some new ones that prove to be of national and international significance.

STATEMENT OF DR. JAY BARTON, VICE PRESIDENT FOR ACADEMIC AFFAIRS, UNIVERSITY OF MISSOURI

SUPERFUND REAUTHORIZATION ACT OF 1986

Senator PROXMIRE. Our next witness is Dr. Jay Barton of the University of Missouri.

Dr. Barton, we are happy to have you here, sir.

Dr. BARTON. Good morning, Senator. I am Jay Barton, vice president for academic affairs at the University of Missouri. I want to urge the committee to consider restoring funding for section 311(d) of the Superfund Reauthorization Act of 1986. This section authorizes 5 to 10 university hazardous substance research laboratories or research centers over the next few years. Funding, of course, requires a specific action on your part.

The problems certainly are real. I think the little illustration that you have seen in the paper and on the newsreels recently about this barge full of garbage means we can turn the old literary cliche around and talk about being at sea in a wash of garbage. And it seems to be a very difficult problem, but one that epitomizes or exemplifies, I think, the issues we face in hazardous waste.

In Missouri alone, for example, there are more than 40 sites that are contaminated with dioxin. The total amount of soil probably approaches 500,000 tons. The cost of cleaning this soil up by known, proven techniques involving incineration runs from a minimum of $100 to probably over $500 a ton. The interesting problem is that, even if that money were authorized to be spent today, we have so many difficulties with our neighbors—not in our backyard. They want the soil cleaned up, but not on this site and certainly not in the next county; and our problem is that we really need new strategies and new techniques that teach us to manage our hazardous waste products a little more successfully.

Less expensive and more desirable techniques, for instance, might be developed or utilized if we had a better knowledge of the movement or the environmental fate of dioxin, but adequate data on that movement does not now exist. Our whole problem with polybrominated biphenols and polychlorinated biphenols is similar. We simply don't know what happens to these as they enter food chains, as they enter the soil, as they move through the substrate.

That is just one illustration of the kinds of problems that I think need to be tackled.

ADVANTAGE OF RESEARCH CENTERS

Research centers, I think, would be useful to tackle the problem of hazardous waste substances because it is a clear case of a place where a center is more effective than an individual investigator. I think Erich Bloch put it very well when he said the other day, to the effect that we need centers to tackle problems that you are not able to tackle on an individual basis because they require multidisciplinary input, a larger mass of researchers than can be mustered by an individual grant or contract.

I think that is the advantage that a consortium of universities with federal agencies and industry, for example, might pull together the kinds of talents that we need.

There need to be several centers, rather than just one, for one of the same reasons that we have developed a number of agricultural research centers. Local conditions control in issues of hazardous waste as well as in agriculture. I have been especially concerned, for example, with what we might call nonpoint source contamination brought about by pesticide applications to the agricultural fields of the Midwest.

I have been pushing for the development of what one might also call the "Toni home permanent" approach, where you add the pesticide and then, so many hours or days or weeks later, you add the neutralizer and put the cost of pollution control and hazardous waste control on the user, rather than on the state and federal governments at some later time, after it enters the watershed and the water supply.

I think that picking the sites and the centers and the people to carry out this task is a clear case for solid peer review, that this is an issue that we want the very best possible research to tackle and with guidelines that mandate review, that mandate control, I think we can achieve the goals. Thank you very much.

Senator PROXMIRE. Thank you very much, sir. We very much appreciate your testimony. I am going to ask Tom van der Voort to pursue this with a question for you, and then I will come right back to hear Mr. Lester of the Council on Energy Resource Tribes.

Dr. BARTON. Thank you, Senator.

Senator PROXMIRE. Go right ahead, Tom. I have to go over for a vote. That is the only reason I am leaving; I will be right back.

Dr. BARTON. I understand. Thank you.

Mr. VAN DER VOORT. The question has to do with your proposal, of course, that we restore funding for 5 to 10 university research centers. On the other hand, a recent report by the Environmental Protection Agency entitled "Unfinished Business," a comparative assessment of environmental problems, stated, and I am quoting here:

> Areas of high EPA effort but relatively medium or low risks include RCRA sites, Superfund, underground storage tanks, ground water pollution, and municipal nonhazardous waste sites.

If we are to fund hazardous research centers, we would be funding an area that EPA has defined as of relatively medium or low risk. Can you think of any other lower risk areas where we might find the money to do that?

Dr. BARTON. I am thinking less about the risk than about the problems we face. We are about to hold hazardous wastes in this nation on our lap because we can't do anything with them and we can't find a place to put them. My colleagues in Arizona tell me that they can't store things above ground because they get complaints from the oracle landowners. They can't store things below ground because they face the problems of contamination. It is out of sight, out of mind. Clearly, I think the national policy problems in managing hazardous wastes are of the highest risk. I am in a state that is transected by a major I–70 Interstate Highway and a major east-west rail line. The Governor of the state is notified every time a train carrying any nuclear waste reaches the border, and there is apparently some political pressure for the Governor to act negatively and not permit that train to go. We are going to have trains floating around the nation very much like this barge floating around the Atlantic and the gulf, if we aren't careful.

It clearly is an issue that has deep biological and scientific implications but very, very important public policy issues, too.

Mr. VAN DER VOORT. I guess that was going to be my follow-on question, that is, to what extent is the problem you are talking about a political problem rather than a problem for basic research? Obviously, there is a little of each.

Dr. BARTON. There is, indeed. I think our efforts to develop a series of national sites for the storage of nuclear wastes from nuclear reactors is a good case in point.

Mr. VAN DER VOORT. All right. Thank you very much. I guess we will stand in recess until the chairman returns.

Dr. BARTON. Thank you, sir.

[The statement follows:]

STATEMENT OF JAY BARTON, VICE PRESIDENT FOR ACADEMIC AFFAIRS, UNIVERSITY OF MISSOURI

I am Jay Barton, Vice President for Academic Affairs, at the University of Missouri.

The United States needs University Research on Hazardous Substances.

The University urges the committee to consider restoration of funding for section 311(d) of the Superfund Amendments and Reauthorization Act of 1986. This section authorizes the establishment of five to ten University Hazardous Substance Research Centers over the next few years. However, the Conference Report specifically prohibits use of the Superfund to finance the centers and certain other research activities. The specific reason for this prohibition appears in the Report as follows:

> "The conferees believe that until the Agency evaluates and defines specific research requirements, the Superfund should be reserved for higher priority site-related activities affecting public health and safety."

We agree that public health and safety must be primary concerns in dealing with the many potentially hazardous Superfund sites which will be scheduled for cleanup now and in the future, and it is understandable and proper that the Report reflects what is certainly a very real public concern. Nevertheless, we also believe that failing to undertake a broad-based university research effort on hazardous substances is likely in the long run to cost far more money than it saves. This is so because there are many fundamental questions that need to be answered before large-scale cleanup efforts on sites contaminated with hazardous wastes should be begun.

The problems are real.

An example from the State of Missouri may be illustrative. Missouri has more than forty sites known to be contaminated with dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin), and the total amount of contaminated soil may equal or exceed 500,000 tons. The only proven technology for decontaminating the soil is incineration, which is not only exceedingly expensive (estimates of $100 to over $500 per ton have been made, for a total cleanup cost of fifty million to one-quarter billion dollars) but may present other problems as well (e.g., residents' acceptance of having the incinerator located near them; disposal of the ashes after incineration; etc.). The environmental Protection Agency has listed a variety of options for Times Beach, Missouri's most extensively contaminated site. The options include (1) taking no action toward cleaning up the site, (2) taking limited action toward stabilization of the contaminated materials, (3) in-place containment by covering over the contaminated areas with a foot of soil, (4) on-site land disposal in a concrete facility erected at the site, (5) off-site disposal at a commercial hazardous waste facility, (6) on-site thermal treatment in an incinerator erected at Times Beach, and (7) off-site thermal treatment in an incinerator located elsewhere. Incineration is a technology which has been proven to be effective, but it is the most expensive option. Less expensive and more desirable techniques could perhaps be utilized or developed if we had a better knowledge of the movement and environmental fate of dioxin, but adequate data do not now exist. A relatively small investment in research on these phenomena would have the potential to pay exceedingly large dividends if it indicated that some solution other than incineration was just as effective yet less costly. This would benefit not only Missouri, but other states where sites heavily contaminated with dioxin have been found.

And, of course, dioxin is only one compound of the thousands of chemicals found in hazardous waste dumps. Some of these chemicals, even though they may not be as toxic as dioxin, may present even more widespread health risks and even heavier economic burdens because they occur more frequently or are in greater abundance. You will recall the case in Michigan a few years ago when polybrominated biphenyls, or PBBs, accidentally became contaminants of animal feed. Although PBBs are considerably less toxic than dioxin, this incident resulted in the loss of many millions of dollars to Michigan and its citizens. PBBs and their close relatives, the polychlorinated biphenyls, or PCBs, are likely to present problems for years to come because of accidents or irresponsible handling of waste materials; but, like dioxin, we do not have good data describing the movement and fate of PBBs and PCBs in the environment, yet this information is necessary to design the most effective and economical mitigation strategies for these ubiquitous compounds.

There are many other examples of many other chemicals that could be cited, and the questions become even more intractable when we are dealing with complex mixtures of hazardous materials such as are found at Love Canal. We have no good way of predicting the precise degree of hazard even if we know the types and amounts of toxic substances involved. Such problems can best be attacked by research which is not necessarily site-specific, although it will ultimately be used to deal with specific sites.

We must learn how to manage our hazardous substances.

Granted that more research on these important problems needs to be done, why is it necessary to establish special centers rathern than rely on the usual grants and contracts that have produced so much good research in the past? Erich Bloch said it concisely when he was discussing the intention of the National Scioence Foundation to establish science and technology centers: They are needed, he said, to tackle problems that you are not able to tackle on an individual grant basis because they require a multidisciplinary approach and need a larger mass of researchers than can be mustered under an individual grant or contract. This is precisely the advantage that the University Hazardous Substance Research Centers would have if they were set up to include, in a consortium-like arrangement, expertise found in different university departments, on different campuses, and in state and federal agencies and industry. Only by bringing together scientists from a variety of disciplines and with different backgrounds and experience can we hope to mount the effort that will be needed to provide timely solutions.

As we see it, the direct EPA funding for a Center would not necessarily constitute the major part of its budget and, indeed, might be a rather small percentage. We would expect that the university would regard the center as an investment in research and public service, as well as a resource for graduate and undergraduate student training. We would also expect each Center to receive substantial financial support from private industries which have a large economic stake in hazardous substance research--and many of them do. The Chemical industries foresee the necessity of managing all of their hazardous wastes on-site within a very few years. And, finally, we would expect the centers to undertake some specific Superfund site-related research projects. But even if the direct EPA funding for a Center was a relatively small part of the total, it would be important because it would provide the stability needed to keep the core group of researchers together and interacting on common problems. And, also important, it would be a tangible recognition of the quality of the Center and its identification as a national resource. Such recognition would help the Center attract and hold the most qualified personnel to attack the most important problems.

Why should there be several Centers rather than a single one which would serve the entire country? Part of the reason is that it is often advisable to look at a problem from several different viewpoints. Each Center would have a unique collection of personnel, and each could be expected to emphasize different but complementary technologies. Furthermore, some of the tasks undertaken by the Centers would undoubtedly have a strong regional flavor. Hazardous waste management problems in the desert southwest can be expected to differ from those in New England, and the approaches taken to handle them may also be different. Finally, not all of the toxic waste problems in an area are at Superfund sites. In Missouri, for example, some of the hazardous waste sites believed to be among the State's most serious do not qualify for Superfund status. We would expect the Research Centers to be responsive to the local as well as the national needs, so a plurality of approaches would be an asset.

We need the best possible research and development.

Because of their importance and great potential influence on the direction of hazardous substance management, the Centers need to be chosen with great care.The selection of the Centers absolutely has to be made on the basis of a thorough merit review of the candidates. Each center selected should be expected to undertake periodic scientific reviews of its ongoing programs and those proposed for the future to make sure they continued to be responsible to national and regional needs. With these guidelines, we predict that your approval of funding for the establishment of University Hazardous Substance Research Centers will be an action which you wil look back on with satisfaction.

Mr. Chairman, members of the Committee, I want to thank you for the opportunity to present this testimony.

[Whereupon, a brief recess was held.]

Senator PROXMIRE. Mr. Lester, the executive director, Council on Energy Resource Tribes.

Is Mr. Lester here?

[No response.]

STATEMENT OF AUDREY McMAHON, ASSOCIATION FOR CHILDREN AND ADULTS WITH LEARNING DISABILITIES, INC.

Senator PROXMIRE. All right. Ms. Audrey McMahon of ACLD, Inc.

It is nice to have you here, Ms. McMahon. You are a patient person. I am sorry I had to go over to the floor to vote.

Ms. McMAHON. Thank you, Senator Proxmire. I am just delighted to be here and I do appreciate your attention. I especially appreciate your affirmation a few moments ago that our children's potential should be the nation's No. 1 priority, and we have a great bond in common on that issue.

I am Audrey McMahon, as you know, and I am with the Association for Children and Adults with Learning Disabilities, Inc., which is a voluntary, parent-run organization. We are not neurochemists or budgeteers, but we number 60,000 members and we are interested in reducing the incidence of our membership—of learning disabilities among our membership.

LEARNING AND BEHAVIOR DYSFUNCTION

And I am here to point to neurotoxins as a challenge to the health and well-being of the American public and recognized as such by Congress in its 1986 directives to the Environmental Protection Agency, and I want to make a connection between the rising thresholds of toxic pollutants and learning and behavior dysfunction. Learning disabilities are the most prevalent of all neurological disorders. It is the fastest growing handicap and condition affecting the nation's children.

And now, here is the under-recognized connection between toxins and learning disabilities. During fetal and early periods when the brain is developing, it is exquisitely vulnerable to insults which may produce permanent alterations. Lead is the best researched and documented example. The dose and duration of toxic insult in infancy may be infinitesimal compared to what the adult can tolerate. Furthermore, adverse effects may be cumulative and people already compromised may become the most susceptible.

My association is pleased that, as well as cancer, neurobehavioral alterations including learning have recently become a recognized end point for the testing of toxins.

Under the Toxic Substances Control Act, the Environmental Protection Agency is required to (1) research risk assessment methods, (2) control existing chemicals, and (3) review new ones. But after 10 years, no chemicals have yet been tested for behavioral neurotoxicity. There is a premarket screen, and there is no requirement for postmarket surveillance.

Our association worries especially about pesticides which are specifically aimed at destroying the central nervous system and about many household chemicals known to be toxic. This is our exhibit wheel—which I hope you have—demonstrating how ubiquitous these hazards are. As your committee goes about the difficult task of weighing out the dollars—and I don't know if you are going to ask me that question at the end [laughter]—we beg you to balance the scarcity of funds with consideration of the vulnerability of the developing brain in the total long-term national losses due to the prevalence of preventable neurological dysfunctions. We ask that, despite all, you increase the financial ability of the Environmental Protection Agency to meet its responsibilities to the public fully, adequately, and aggressively in the rising number of chemicals that it has to cope with. All this was recommended by the Committee for Science and Technology of the 99th Congress. Thank you.

Senator PROXMIRE. Thank you very much, Ms. McMahon. I am going to ask you that question. I am going to ask it because I do think you have a very, very good cause, of course. You say that after 10 years there are still no chemicals being tested for behavioral neurotoxicity?

Ms. MCMAHON. Yes.

Senator PROXMIRE. And there are still no requirements for postmarket surveillance. Can you think of any area or any other EPA efforts that might be cut to offset an increase?

Ms. MCMAHON. Does it have to be——

Senator PROXMIRE. If you can't at the moment, and it is unfair to ask you to tell us off the top of your head, but perhaps you could think of it and drop us a line? We would like very much to hear from you.

[The information follows:]

LETTER FROM AUDREY R. MCMAHON

MAY 11, 1987.

Hon. WILLIAM PROXMIRE,
Dirksen Senate Office Building,
Washington, DC.

DEAR SENATOR PROXMIRE: It was a privilege to come before you at the Subcommittee on HUD-Independent Agencies during the hearings on EPA matters. I admired what you said to Roxanne Bradshaw about children being the Nation's No. 1 priority a whole lot.

Thank you for questioning me on the matter of having no behavioral tests for neurotoxicity yet. It was not appropriate to launch into a discussion of where things stand on that issue during my 3 minutes, but I would like to refer you to the Federal Register May 15, 1986, in which proposed rules for possible test methods for certain chemical substances are set forth. Alterations in behavior are stipulated as the endpoint of that testing which is the first time neurobehavioral toxicity has been at issue. It is not known how long it will take for these test method rules to be formulated and approved or whether it will be possible to proceed with the testing of separate chemicals on a piecemeal basis in sufficient number to cover the presumed threat.

Beyond that, combinations of chemicals not hazardous singly needs consideration. The significance of stemming the rising thresholds of many pollutions before the time bomb gets out of hand looms big on our horizon. This is why I demurred when you asked me what other EPA activities should be reduced in order to increase budgets for toxins. The whole agency funding should probably be reconsidered in light of EPA's rising planetary responsibilities. Evidence of consistently increasing pollutions are evident even to a solid (but huge) parent group like ourselves, not famous for being alarmist.

With sincere respect for your acumen and good nature in the face of the burden you bear on behalf of the nation.

Sincerely,

AUDREY R. MCMAHON,
Chairman, ACLD-Scientific Studies Committee.

Ms. MCMAHON. We are not versed in all the EPA finances by any means, but we are considerably concerned about the vested interests who make a great deal of money from the toxins that later have a detrimental effect on the potential of children.

Senator PROXMIRE. Do you think a use tax might be useful?

Ms. MCMAHON. They have been talking about effluent taxes and so forth, and I think of the alcohol industry, the tobacco industry, the lead industry, and of the myriad of chemical uses in various concoctions and pesticides and heavens knows what. And we are not budget people, but this seems like a very common sense way to go about it.

Senator PROXMIRE. Thank you very much.

[The statement follows:]

STATEMENT OF AUDREY R. MCMAHON, REPRESENTING THE ASSOCIATION FOR CHILDREN AND ADULTS WITH LEARNING DISABILITIES, INC.

Descriptors of content : proliferating neurotoxins; fetal vulnerability; permanence of effects; learning disabilities - cost, prevalence, human waste; premarket testing; neurobehavioral endpoint; 99th Congress directives to EPA; increased funding.

Good morning, my name is Audrey McMahon. I represent the Association for Children and Adults with Learning Disabilities, Incorporated which is a voluntary parent-run organization of 60,000 members. The size of the membership attests to the urgency of the problem. I come to you as Chairman of the Committee on Scientific Studies. I want to point to neurotoxins as a challenge to the health and well being of the American public. This challenge was recognized by Congress in its recent recommendations to the Environmental Protection Agency and I want to emphasize the connection between pollution and learning disabilities.

Learning disabilities is the most prevalent of all neurological disorders. It is also the fastest growing handicapping condition affecting the nation's children. I want to suggest that the Environmental Protection Agency's new incentive on neurotoxins may well be critical to reducing these developmental disabilities of hitherto unknown origins, but such an incentive needs financial support as well as moral support. During fetal and early periods during which the brain is developing it is exquisitely vulnerable to insults which may produce permanent alterations. The dose and duration of insult may be infinitessimal compared to what the adult can tolerate. Chemicals and especially pesticides which are designed specifically to act on the central nervous system, and household solvents of known toxicity are a matter of gravest concern to us.

Exposure to lead provides a good example of widespread subtle behavioral effects which can result from exposure to neurotoxic chemicals. Recent figures suggest that cognitive and psychological decrements can be expected in 7% of all U.S. preschool children. That is the number of children with blood levels above the so-called "safe" level. Exposure to lead and other neurotoxic chemicals IS PREVENTABLE.

The National Institute of Occupational Safety and Health identified neurotoxicity as one of the ten leading workplace disorders. Since the fetus, infant and young children are biologically super sensitive compared to adults to environmental insult and may be permanently affected by exposure to chemicals during development, one can only shudder at what comparable statistics might show up in this junior population if it were adequately evaluated.

Between 1978-1985 the Office of Toxic Substances reviewed 6,000 chemicals, about 15% of which generated sufficient concern regarding health effects to require detailed review. For the vast majority of these chemicals insufficient data are available to estimate risk, and yet the pace accelerates. The Environmental Protection Agency budget for Research and Development has suffered from cumulative reductions over the last years preventing that

Agency budget from developing appropriate test methods to estimate risk to human health. Under the Toxic Substances Act the Environmental Protection Agency is required to: 1) Develop new knowledge on risk assessment and methodologies, 2) control risks from existing chemicals, and 3) review new chemicals and restrict their use if necessary. Yet after ten years still no chemicals are being tested for behavioral neurotoxicity as a premarket screen and there are still no routine requirements for postmarket surveillance.

The Association for Children and Adults with Learning Disabilities is particularly interested in studies on neurobehavioral toxicity which addresses the effects of a chemical on the way the animal behaves, moves, sees, hears, feels, learns. We know that children with learning disabilities may have dysfunctions in some or all of those categories. The Association for Children and Adults with Learning Disabilities is pleased that altered neurobehavioral function including learning potential has recently become a recognized end-point for the testing of toxins. We were among the groups responding to the Federal Register proposals of 1986 for test methods for certain chemicals chosen by the Environmental Protection Agency for neurotoxicity testing under Section 4 of the Toxic Substance Control Act. However, considerably more research is still needed to develop methods which can be applied to testing even these few preliminary chemicals out of the 900 plus chemicals previously identified. If the Environmental Protection Agency is to move effectively into the pressing new arena of neurotoxicity, their budget in this area needs to be commensurate. If the Environmental Protection Agency budget today was measured in terms of buying power it would be comparable to its 1970 budget, a time when fewer demands were placed upon it.

The report from the 99th Congress Committee on Science and Technology regarding Neurotoxins recommends that:

1. Every federal agency charged with testing chemicals should adopt a three-part toxicity screen.

2. The Environmental Protection Agency and federal agencies performing neurotoxicological research should increase their allocations of resources to long-term research regarding the mechanisms of neurotoxicity and detection of neurotoxins.

3. The Environmental Protection Agency should study the feasibility of an amendment to the Toxic Substance Control Act to create a presumption in favor of toxicity testing of new and existing chemicals.

We enthusiastically endorse these recommendations!

The dollar cost to the nation of educating the escalating numbers of learning disabled children and of the supportive services to those who become underachieving adults runs into hundreds of millions of dollars. The cost benefit of such preventive measures as reducing toxic insults to the central nervous system cannot actually be figured in dollar amounts, in human terms or in increased national productivity. Common sense, however, begs your consideration of the intact developing brain as a critical national asset when budgeting for the Environmental Protection Agency. It obviously needs substantial increases to allow it to fully and adequately address the tasks the 99th Congress recommended. Thank you.

STATEMENT OF JOHN BASTEY, DIRECTOR OF THE MAINE BUREAU OF AIR QUALITY CONTROL, ON BEHALF OF THE NORTHEAST STATES FOR COORDINATED AIR USE MANAGEMENT

NATIONAL AIR QUALITY BUDGET

Senator PROXMIRE. Our next witness is John Bastey, chairman of the Northeast States for Coordinated Air Use Management.

Mr. Bastey, we are happy to have you with us. What state are you from, sir?

Mr. BASTEY. The state of Maine, sir.

Senator PROXMIRE. The state of Maine?

Mr. BASTEY. Another favorite state.

Senator PROXMIRE. Yes, indeed. Maine is kind of a Wisconsin of the Northeast. [Laughter.]

I believe Maine people refer to themselves as "Maineacs." [Laughter.]

Mr. BASTEY. I am John Bastey, as I said, director of the Bureau of Air Quality in the state of Maine and also the Chairman of NESCAUM, an organization of northeastern states air quality directors. I thank you for this chance to talk to you today because I am worried.

The federal share of the national air quality budget has been cut over the years by 24 percent in real dollars, and that scares me and it should scare you.

NESCAUM believes that you need to restore $25 million to the budget line for EPA for air quality for this year, this coming year. We believe this because the air quality program relies on strong federal leadership and support to get the job done, to keep the air clean; but the federal government's commitment seems to be faltering. When the Congress wrote the Clean Air Act, it recognized that the states didn't control the wind. Congress saw the polluted air from one state drifted to another. What was burned in Ohio or Kentucky ended up in the Northeast or some other downwind area.

FEDERAL ROLE ESSENTIAL

The Congress recognized that there needed to be a law that equalized air pollution efforts between the states, and it recognized that federal assistance and leadership was essential to the development of cooperative efforts between all levels of government. Over the years, the federal government has supported about half of the air programs in the Northeast, and the states have supported the other half, a partnership between governments to do a tough job, but that is not true any more.

The federal share of the national air quality budget has slipped, and as a result state air toxic programs may never become law, acid rain acts won't be passed, one-third of the air quality monitors in the nation have already been turned off, and federally supported training programs have been all but abolished. We are doing our part in state capitols. In Maine, we have increased our portion of the air budget by almost two-thirds, a big commitment for a small rural state.

Connecticut has increased its support by almost 70 percent of the total air budget, and other northeastern states are trying to pick up the slack left by the federal cuts.

Even as the budget was cut, air pollution control and regulation became more expensive. Our victories are in the past. Now, we fight more difficult and dangerous pollutants: chlorinated hydrocarbons, dioxins, toxic chemicals, poisonous metals, and organic solvents, to name a few.

To respond to these new hazardous pollutants, we must undertake more sophisticated and expensive solutions. Our base program must be expanded to include air toxics, asbestos abatement, ozone attainment, and more while monitoring and licensing enforcement activities continue. Without additional federal support, we will never be able to complete all of the new and important high-priority tasks and keep the base program running.

DISINVESTMENT

The EPA's response is that the states would disinvest parts of the basic program. Disinvestment, they say, means cutting back on basic program elements in order to save time that can be used on new program elements, reducing monitoring to do toxics work, or decreasing enforcement to spend time on asbestos.

The reality is that disinvestment is a word game, a way for EPA to portray itself as tightening up on control of the program as it is cut to the bone through inflationary erosion.

There is little fat left in state air quality programs to disinvest. We have already tuned the regulatory engine as tight as we can. The air quality directors in the Northeast recommend in the strongest possible terms that the federal government reinvest itself in air quality to the tune of at least $25 million in 1988. We need the national Treasury to support its part of the financial burden again as anticipated by the Clean Air Act.

We want the air to get cleaner, and we are worried that it is as clean as it will ever be right now. Thank you, Senator.

Senator PROXMIRE. I want to thank you for your table in your attachment. It is very vivid and impressive. You point out that EPA funds have dropped from $1.8 million to zero since 1972 and that congressional funds have dropped, not that much of course—$300,000 to $265,000. How do you discriminate between EPA funds and congressional funds?

I am referring to that table you have on the back, the attachment. In this table, you have one table labeled "EPA Funds" and the next is "Congressional Funds."

Mr. BASTEY. Mike Bradley compiled this for me. So, I will get back to that with an answer if I could, please?

[The information follows:]

LETTER FROM JOHN BASTEY

MAY 29, 1987.

Senator WILLIAM PROXMIRE,
U.S. Senate,
Committee on Appropriations,
Washington, DC.

DEAR SENATOR PROXMIRE: This letter is in response to your question on the proposal for the establishment of a national state and local air pollution technical coordination center made by the Northeast States for Coordinated Air Use Management [NESCAUM] at the Appropriations subcommittee hearings on May 8, 1987.

State and local air quality agencies need to have access to up-to-date scientific and technical air quality control information. Previously the U.S. Environmental Protection Agency provided this information, but during the past several years, their assistance has been drastically reduced. Air quality organizations such as NESCAUM, the State and Territorial Air Pollution Program Administrators [STAPPA] and the California Air Pollution Control Officers Association [CAPCOA] have attempted to fill the void, but have been somewhat constrained by limited resources.

As new problems arise or are recognized, air quality agencies need to find new and more complex solutions. States have different levels of resources for scientific research and development of new techniques and methods. Often, state and local agencies develop new techniques and strategies to deal with air quality problems. Without adequate communication between the over 250 air quality control agencies across the country, new techniques may remain unknown and agencies which desperately need new solutions could be left out in the cold.

As you are aware, the responsibilities of state and local air quality control programs have increased significantly during the past 6 years to include controlling routine toxic air emissions, regulating municipal and hazardous waste incineration, instituting acid deposition research and control programs, implementing vehicle antitampering programs, and developing visibility control plans. In the near future, air quality control programs will be implementing additional and somewhat controversial ozone reduction strategies, addressing the fine particulate problem, and developing programs to prevent accidental release. To address these issues effectively, state and local air quality control agencies need access to their counterparts' experiences using new air quality assessment measurements and compliance techniques.

The primary objectives of the national state and local air pollution technical coordination center would be to gather and disseminate technical information on a variety of air quality issues. The coordination center would gather reports and data from research projects and information on inspection techniques, permitting requirements, dispersion modeling, risk assessment techniques, new control technologies, and many other specific air quality issues. The coordination center would also sponsor workshops and training courses on specific air quality issues. These activities would serve to improve and upgrade job performance in the various state and local air quality control agencies and help to make the staff better qualified to deal with new air quality problems.

In section 103(a)(5), the Clean Air Act recognizes the need to "conduct and promote coordination and acceleration of training for individuals relating to the causes, effects, extent, prevention and control of air pollution." This section also provides an effective funding mechanism to meet this important technical training need. I feel that an appropriation of $1 million to establish the National State and Local Air Pollution Technical Coordination Center would be a very cost effective method of addressing this need.

Attached is a list of several air quality issues for which state and local air quality agencies have expressed a need for technical assistance or training. Many state and local air quality control administrators from across the country support this proposal. Mr. Donald Theiler expressed strong support for the National State and Local Air Pollution Technical Coordination Center in STAPPA and ALAPCO's testimony before your subcommittee on May 8, 1987. I urge you to seriously consider providing funding support for this effort in the fiscal year 1988 budget.

Please contact me or Michael Bradley, executive director of NESCAUM, if we can provide you with additional information.

Sincerely,

JOHN BASTEY,
NESCAUM Chair.

Senator PROXMIRE. Oh, I see. EPA is what the administration requested, and congressional funds are what——

Mr. BASTEY. And they have allocated none of that money to training——

Senator PROXMIRE. So, overall, even after congressional action, it has dropped 1.4?

Mr. BASTEY. Right.

Senator PROXMIRE. To 265. The number of students who are training has dropped from over 2,000 to 825.

Mr. BASTEY. What has happened in the Northeast, Senator, is NESCAUM has taken some seed money from the state budgets and started to put together a training institute in the northeastern states area, so that my staff and the states from the northeastern area can be trained once again in enforcement of air pollution or control device technologies and things like that.

Senator PROXMIRE. You have two fine, very active Senators. Senator Mitchell is particularly active in the environmental area, and you need to call this to his attention.

Mr. BASTEY. Thank you very much.

Senator PROXMIRE. Thank you very much.

[The statement follows:]

STATEMENT OF JOHN BASTEY, DIRECTOR, MAINE BUREAU OF AIR QUALITY CONTROL, ON BEHALF OF THE NORTHEAST STATES FOR COORDINATED AIR USE MANAGEMENT

Mr. Chairman and members of the Subcommittee. my name is John Bastey. I am Director of the Maine Bureau of Air Quality Control. Today I appear before you to represent the views of the Northeast States for Coordinated Air Use Management (NESCAUM) of which I am the Chairman. NESCAUM consists of the air pollution control agencies in the eight northeast states: Connecticut, Maine, Massachusetts, New Jersey, New York, New Hampshire, Rhode Island and Vermont. NESCAUM's purpose is to promote cooperation and coordination between the air quality programs in the member states, encompassing both technical and policy issues. To accomplish this, NESCAUM sponsors frequent air quality training programs, participates in national debates and promotes a variety of research initiatives. NESCAUM appreciates the opportunity to present the organization's views on the Environmental Protection Agency's FY-1988 federal budget request for Clean Air Act Section 105 funds for state and local air pollution control agencies.

NESCAUM believes that the President's proposed budget request of $95 million for Clean Air Act Section 105 air grants will not be adequate to support an effective national air quality control program. Since the 1977 revisions to the Clean Air Act, federal support to state air programs has decreased by over 20% in real dollars. This decline in federal funding coincided with the transfer of many federal responsibilities to the states. These responsibilities include administering the Prevention of Significant Deterioration program, ensuring the adherence of stationary sources to New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants, development and implementation of State Implementation Plans and inspecting air pollution sources. In addition, new state program initiatives and increased administrative program costs have presented most state air quality control programs with very serious budgetary constraints. Therefore, NESCAUM believes that a significant increase in federal funding for state air programs is imperative.

The major objective of state air quality management officials is to protect the public from exposure to unhealthy levels of air pollutants. To meet this objective effectively, state air quality control programs must have the resources and technical skills both to prevent the deterioration of the existing air quality and to evaluate and act on new threats to public health. During the past fifteen years, the northeast air quality control agencies have made significant progress in reducing ambient levels of sulfur dioxide, particulates, carbon monoxide, ozone, nitrogen oxides and lead. This progress had come about through the development of strong base programs consisting of:

- source evaluation and permitting
- ambient monitoring for all criteria pollutants
- inspection and compliance activities

- enforcement activities
- program planning and regulatory development

These important activities serve as the technical foundation for the state air quality control programs and provide the core program support for preserving the present air quality and addressing new air quality problems. Because of the resource constraints of recent years and the expansion of program responsibilities, these base programs have been forced to absorb substantial funding reductions. Although most state air programs have developed alternative funding programs and have phased out non-essential activities, the diversion of base program resources to new federal and state priorities has increased annually for the past six years. What has been the effect of these reductions?

1. The agencies ability to evaluate new source permit applications promptly has diminished significantly, resulting in delays of up to a year.
2. Ambient monitoring networks have been scaled back to include only the most essential monitoring sites. Furthermore, the U.S. EPA estimates that up to 50% of the existing ambient monitors in the field are in only "fair to poor" condition due to the lack of resources to replace worn-out monitoring equipment.
3. The majority of northeast states no longer perform stack emission tests. Stack testing was a common base program activity during the 1970s, but has been phased out of almost all the state air quality control programs due to lack of funds.
4. The number and frequency of industrial source inspections has decreased. Large industrial and utility sources continue to be inspected annually, but numerous smaller sources which may pose an even greater threat to public health are not inspected as frequently as they should be.
5. Due to rising operating expenses and the lack of new resources, many state air quality control programs are not able to fill technical and professional staff vacancies. One state has been forced to administer a program which has grown in responsibility and complexity with a staff which has decreased by 33% over the past several years.

The erosion of the base program is slowly undermining the air quality control program. With the President's request for level federal funding in FY-88, the future looks bleak. It is critical that states are able to continue their efforts to protect public health. They will not be able to do this if the base program is continually weakened. States can continue to protect public health only if the base program is restored.

Many of the air quality problems which the states are addressing today and will need to address in the future require increasingly sophisticated solutions and will therefore be even more dependent on a strong base program. In addition to ensuring that the progress already achieved is maintained, states will have to develop new programs to solve the following air quality problems:

1. Much of the northeast continues to violate the ozone National Ambient Air Quality Standard during the warmer months of the year despite implementation of numerous industrial and mobile source controls.

NESCAUM anticipates a major joint state and federal ozone control program in FY-88. This program will include the development of updated attainment plans, implementation of additional control programs and increased compliance and inspection activities. The President's FY-88 budget does not account for any of these expected increases in the ozone control workload.

2. State agencies will also have to devote a sizeable amount of time to attaining the carbon monoxide standard in several of the northeast cities and implementing control programs for the new fine particulate standard.

3. Reducing the exposure to air toxics will continue to require considerable program resources during FY-88. Only a small fraction of the $95 million requested for state air quality control programs is earmarked for controlling air toxics. The northeast states are proud of their role as national leaders in the development of effective air toxics control programs, but additional funds are required if the potential public health benefits from these programs are to be fully realized. These funds will be used to hire additional personnel, purchase equipment, conduct inspections, and inventory and permit industrial sources.

4. Increasingly, incineration is the preferred method of waste disposal in the northeast Incineration of municipal , industrial and commercial , hospital and hazardous waste, are issues of great public concern. Controlling the emission of dioxins, heavy metals, and other toxic air pollutants at all of these facilities is a major strain on the time and funds of all state air quality agencies.

5. Developing and implementing state programs to reduce acidic deposition and visibility impairment will continue to be a high priority for the northeast states. Although they are incapable of imposing emission reductions on the states which contribute most heavily to this problem, the northeast states are taking steps to reduce their own contribution to this serious air quality problem .

6. States recognize the need to control the emission of toxic air pollutants from hazardous waste sites and to prevent accidental chemical releases from industrial facilities. Failure to do so can pose serious health threats. Additional resources must be identified for these efforts if state agencies are to take on these responsibilities in the future.

With these new issues to be addressed, clearly the resources of the state air quality control programs will be spread very thin. Both U.S. EPA and state workload analyses indicate that state air programs need an increase of more than 50% in funding support in order to meet their basic program commitment. Consider also resources needed to act on the problems discussed above and it becomes obvious that that the need for additional resources is critical.

Over the past several years, each of the northeast states has increased funding in response to the serious federal budgetary shortfall. NESCAUM believes that the federal government, as stipulated in Section 101 of the Clean Air Act, should also substantially increase it's funding contribution to state air programs. Therefore, NESCAUM requests that Congress increase the President's FY-88 state air program funding request by a minimum of $25 million.

One additional area of the FY-88 EPA budget of major concern to the northeast states is the lack of resources for training in air pollution control. State and local air pollution control agencies require access to up-to-date technical training in order to maintain strong regulatory programs and to address effectively emerging air quality issues. The U.S. EPA, through its Air Pollution Training Institute, formerly provided state and local air pollution control agency staff with basic air pollution technical training. In recent years, however, this valuable technical assistance has essentially been eliminated. NESCAUM recommends that Congress restore the funding for the Air Pollution Training Institute by appropriating $2.5 million for FY-88 which is roughly equivalent, in real dollars, to funding levels during the 1970s. (see charts in Attachment 1)

Federal direction in addressing and regulating air toxics, various forms of municipal, commercial, and industrial waste incineration, acid deposition, and other air quality issues has been minimal in the past six years. State and local agencies have resorted to learning from one another through their own technical workshops and informal communication to develop appropriate regulatory programs to address these concerns. Clean Air Act Section 103 funds need to be appropriated specifically for a State and Local Air Pollution Technical Coordination Center. This Center would support the development of effective regulatory programs by promoting the exchange of technical information between air pollution control agencies on a national level. (see proposal in Attachment 2) NESCAUM requests that Congress appropriate $1 million for FY-88 to support this valuable effort.

Attachment 1

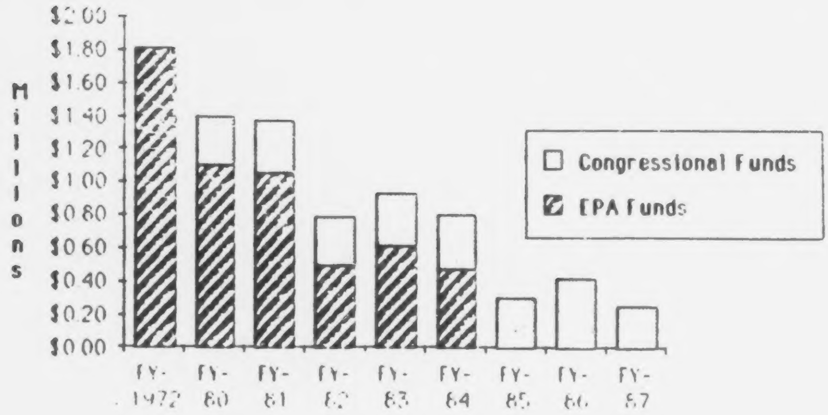
TABLE 1
AIR POLLUTION TRAINING INSTITUTE FUNDING

		EPA Funds	Congressional Funds	Total		# students
FY-1972		$1,820,000				
FY-80		$1,100,000	$300,000	$1,400,000		2133
FY-81		$1,060,000	$320,000	$1,380,000		1998
FY-82		$500,000	$300,000	$800,000		826
FY-83		$624,000	$310,000	$934,000		959
FY-84		$476,000	$335,000	$811,000		667
FY-85		$0	$310,000	$310,000		659
FY-86		$0	$432,000	$432,000		*825
FY-87		$0	$265,300	$265,300		NA

source: EPA/APTI, 1/87
nls;2/20/87

*includes several courses paid for with 105 funds, materials supplied by APTI

Figure 1
Air Pollution Training Institute Funding



ATTACHMENT 2

National State and Local Air Pollution Technical Coordination Center

The complex nature of the many air quality issues state and local agencies face today neccessitates access to technical information, scientific assessments, and the regulatory experiences of other goverment agencies. The state and local air quality agencies also need access to their counterparts' experiences in utilizing innovations in air quality assessment, measurement, and compliance techniques. The establishment of a National State and Local Air Pollution Technical Coordination Center to facilitate the exchange of this information would greatly enhance the development of effective state and local air pollution control programs across the country.

Technical staff of the more than 250 state and local air quality control agencies possess a wealth of expertise on a great variety of air quality issues. The primary objective of a National State and Local Air Pollution Technical Coordination Center would be to gather information on specific air quality issues from experts in various state and local agency and to ensure, through technical workshops and an information clearinghouse, that other government air quality control agencies benefit from their knowledge and experience.

For the past eight years, NESCAUM has sponsored regional technical exchange workshops on a wide variety of air quality control and assessment issues. The majority of these workshops focused on new air quality issues (air toxics, waste combustion, acid deposition, ozone control, etc.) and various air quality technical advances (continuous emission monitoring, computerized information systems, toxics ambient monitoring, advanced dispersion modeling, etc.) Recognizing the benefits of the exchange of technical information, NESCAUM has sponsored several national workshops, primarily for state and local agencies, on such issues as ozone formation and transport, ozone control strategies, municipal waste combustion, air toxics control, and acid deposition research findings. STAPPA and ALAPCO have also sponsored effective national workshops on a variety of air quality technical and management issues.

To develop and manage a National State and Local Air Pollution Technical Coordination Center, a minimum of $1 million of Clean Air Act Section 103 funds should be specifically appropriated by Congress for this center.

National State and Local Air Pollution Technical Coordination Center

Technical Assistance and Training are needed in the following areas:

A. Air Toxics

Dispersion modeling of toxic air pollutants
Evaluating small source/area source air toxics - the "urban toxic soup"
Hazardous emission sources exposure assessment techniques
Hazardous waste site air quality assessment
Indoor air quality exposure assessment techniques
Prevention of accidental releases- field inspections
Source risk analysis - developing risk management and prevention plans

B. Hazardous Waste and Municipal Waste Combustion

Air and solid waste agency issue coordination - e.g., ash handling, ash disposal, enforcement, compliance testing
Continuous Emission Monitoring
Enforcement
Introduction to RCRA for air quality staff
Permitting, combustion controls, and control technologies
Small source incineration - e.g., hospitals, industry
Stack testing

C. Volatile Organic Compounds

Compliance techniques and data analysis for VOC sources
Evaluation and assessment of VOC sources
Mobile source reduction strategies
Permit writing for VOC sources - BACT/BART/RACT/LAER

D. Technical Skills

BACT/BART/RACT/LAER economic calculations
Dispersion modeling - UNIMAP III models
Emission inventory techniques - data analysis
NO_x controls for existing stationary sources
Reviewing and writing cogeneration permits
Using continuous emission monitoring - equipment, computer tie-ins, in enforcement actions

E. Others

Consumer and user practices for residential woodstoves
Coordinating state acid deposition research
Management skills for public agencies
Negotiation and mediation techniques
Regional planning of energy supply, utility regulation, small power production - working with state energy and utility regulatory commissions

brief-traing; 4/24/87

Air Pollution Training Institute or the State and Local Air Pollution Technical Coordination Center

Training is needed in the following areas:

A. Air Toxics

Dispersion modeling of toxic air pollutants
Evaluating small source/area source air toxics - the "urban toxic soup"
Hazardous emission sources exposure assessment techniques
Hazardous waste site air quality assessment
Indoor air quality exposure assessment techniques
Prevention of accidental releases- field inspections
Source risk analysis - developing risk management and prevention plans

B. Hazardous Waste and Municipal Waste Combustion

Air and solid waste agency issue coordination - e.g., ash handling, ash disposal, enforcement, compliance testing
Continuous Emission Monitoring
Enforcement
Introduction to RCRA for air quality staff
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Stack testing

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Management skills for public agencies
Negotiation and mediation techniques
Regional planning of energy supply, utility regulation, small power production - working with state energy and utility regulatory commissions

brief-traing: 4/24/87

STATEMENT OF DONALD THEILER, DIRECTOR, WISCONSIN BUREAU OF AIR MANAGEMENT, ON BEHALF OF THE STATE AND TERRITORIAL AIR POLLUTION PROGRAM ADMINISTRATORS AND THE ASSOCIATION OF LOCAL AIR POLLUTION CONTROL OFFICIALS

Senator PROXMIRE. Our next witness is Donald Theiler, director of the Wisconsin Bureau of Air Management, another one of my bosses.

Mr. THEILER. Yes. [Laughter.]

Thank you, Chairman Proxmire. My name is Don Theiler, and I direct the Wisconsin Air Management Program and I appear here today on behalf of STAPPA and ALAPCO, the national associations of states and local air pollution control agencies. Accompanying me today is Bill Becker, the executive director of STAPPA and ALAPCO.

I am also on the board of directors for STAPPA and ALAPCO and am chairman of the funding committee for these state agencies. STAPPA and ALAPCO represent agencies in 54 states and territories and in more than 150 metropolitan areas.

SECTION 105 GRANTS

I appreciate this opportunity to present our association's view on the EPA fiscal year 1988 budget request for section 105 grants under the Clean Air Act. In fiscal year 1988, as in the past 2 years, President Reagan's proposed budget again includes a request for $95 million for grants to state and local agencies.

In fiscal years 1986 and 1987, acknowledging national efforts to control spending and reduce the federal deficit, STAPPA and ALAPCO supported the President's budget. However, we have now reached a point where we can no longer operate effectively with level federal funding. To make further sacrifices in our programs will severely compromise our ability to provide healthful air for our nation's citizens. We are learning that the problems related to air pollution are more widespread while our programs are deteriorating due to insufficient funding.

THREE AREAS HIGHLIGHTED

Therefore, we are asking that you increase funding by $20 million, and in this oral testimony I would like to highlight three very important areas of the air program which are suffering as a result of this inadequate funding. They are ozone, fine particulate matter, and air toxics.

According to EPA, more than 70 major metropolitan areas in 40 states are not expected to attain the air quality standard for ozone by the deadline at the end of this year. This will impact the health of approximately 95 million people. To address this problem, state and local agencies will be required to undertake numerous new control efforts. These efforts will require significant additional resources and manpower.

The control of fine particulates or, as we call it, PM–10, is another component that has been a victim of less than adequate funding. Studies show that the health effects associated with exposure to fine particulates include respiratory illness, especially in our children, and increased mortality. STAPPA and ALAPCO are delighted that EPA will finally be promulgating a fine particulate standard in the next few weeks. However, over 100 areas are expected to exceed this new standard.

Accordingly, state and local agencies will again be required to assume a whole new set of resource-intensive responsibilities, including the installation and operation in every area of the country of a network of PM–10 monitoring equipment. This equipment alone will cost $2.5 million.

Control of toxic air pollutants has been identified by EPA as one of the nation's highest priorities for air pollution. This is an area being implemented on a shoestring budget in spite of the fact that EPA has concluded that routine releases of toxic pollutants may cause as many as 1,700 cases of cancer each year.

EPA's present strategy for controlling toxic air pollutants relies almost exclusively upon state and local agencies for the development and implementation with no new funding. Our citizens are entitled to a comprehensive and effective air toxics program; yet our budgets prohibit the development of the necessary monitoring networks, emission inventories, training programs, rules and emergency response, and prevention programs.

Please understand that we fully recognize that the responsibility for funding air programs is shared by all levels of government. State and local governments presently provide nearly two-thirds of the resources for the air programs, and that percentage has been steadily increasing.

We have aggressively explored and implemented alternative funding sources, including fees, but it has not been enough.

EFFECT OF LEVEL FEDERAL FUNDING IN WISCONSIN

To summarize, I would like to just outline the effect that level Federal funding has had on the air management program in the state of Wisconsin over the past 3 years. We are currently holding 15 previously filled positions vacant in order to balance the budget this year. Seven of these positions will be eliminated permanently. This represents nearly 10 percent of the staff resources. We have shut down 20 monitors and are considering shutting down 20 more. We are in the process of returning the PSD permanent program and some elements of our enforcement program to EPA.

Without additional funding, Wisconsin simply cannot do the job. Thank you very much for the opportunity to testify today, and I would be happy to answer any questions.

Senator PROXMIRE. How practical would it be to impose some kind of a user tax or effluent tax? It would have to be done, I presume, at the federal level rather than at the state level?

Mr. THEILER. Yes. In our written testimony that we submitted, we are encouraging the Congress to consider the development of an emissions fee to be included as a part of the reauthorization of the Clean Air Act. So, we do think it is a feasible alternative.

Senator PROXMIRE. Thank you, sir. Thank you very much for a fine presentation.

Mr. THEILER. Yes, thank you.

Senator PROXMIRE. It has been very helpful.

[The statement follows:]

STATEMENT OF DONALD THEILER, DIRECTOR, WISCONSIN BUREAU OF AIR MANAGEMENT, ON BEHALF OF THE STATE AND TERRITORIAL AIR POLLUTION PROGRAM ADMINSTRATORS AND THE ASSOCIATION OF LOCAL AIR POLLUTION CONTROL OFFICIALS

Mr. Chairman, Members of the Subcommittee, my name is Donald Theiler and I am the Director of the Wisconsin Bureau of Air Management. I appear here today on behalf of the State and Territorial Air Pollution Program Administrators (STAPPA), of which I am Chairman of the Program Funding Committee and a member of the Board of Directors, and the Association of Local Air Pollution Control Officials (ALAPCO). Accompanying me is S. William Becker, the Executive Director of STAPPA and ALAPCO.

STAPPA and ALAPCO are the national associations of air pollution control agencies in the 54 states and territories and more than 150 major metropolitan areas across the country. The associations' members have primary responsibility for implementing our nation's air pollution control laws and regulations and ensuring healthy air quality for our citizens. I appreciate this opportunity to present the associations' views on the Environmental Protection Agency's federal budget request for FY 1988, particularly on the amount requested for state and local air agencies under Section 105 of the Clean Air Act.

This year, as in the past two years, President Reagan's proposed budget includes a request for $95 million for FY 1988 grants to state and local air pollution control agencies under Section 105 of the Clean Air Act. In FY 1986 and FY 1987, acknowledging the President's attempts to develop an equitable budget and the efforts of both the Administration and Congress to reduce the federal deficit, STAPPA and ALAPCO supported the President's requests for $95 million. Accordingly, we have put forth our best efforts to effectively manage our limited resources. Our endeavors to address continually increasing workloads have been further complicated by the fact that federal support has actually decreased in terms of real dollars, thereby limiting the purchasing power of available funds.

We have reached a point where we can no longer operate efficiently with level federal funding. To make further sacrifices in our air programs would severely compromise our ability to provide healthful air for our nation's citizens. The adverse health effects related to air pollution are becoming more and more widespread as base programs deteriorate due to insufficient funding. Therefore, as responsible public servants, we are compelled to ask that state and local air pollution control agencies receive a $20 million increase in Section 105 funds.

The foundation of the air program--the base or core programs, designed to control criteria pollutants (e.g., ozone and particulates)--has been eroded nearly to the point of ineffectiveness. Our ability to develop and implement programs to ameliorate the hazardous consequences of toxic air pollutants has also suffered significantly from a lack of funds. We have cut costs, reduced staffs and eliminated any program components that could possibly be construed as superfluous. Since 1977, for example, state and local agencies have decreased the number of air monitoring stations by over 57 percent. In my own state of Wisconsin, lack of adequate federal funds has forced us to reduce our staff by 10 percent. But as the power of our funding dollars has diminished, efforts such as these have not been enough.

A recently published EPA report concludes that the health, ecological and welfare risks associated with air pollution, particularly exposure to criteria pollutants, are extremely high in comparison to those related to other environmental problems ("Unfinished Business: A Comparative Assessment of Environmental Problems"). To protect the health of our citizens and the condition of our environment, an increase in federal funding for state and local air programs would be a reasonable and responsible action on the part of Congress.

Currently, at least three fundamental components of the air program are suffering as a result of inadequate funding. These include ozone, particulate matter and air toxics.

According to EPA, more than 70 major metropolitan areas in 40 states are not expected to attain the National Ambient Air Quality Standard for ozone by the congressionally-mandated December 31, 1987 deadline. STAPPA and ALAPCO are deeply concerned with the serious health consequences resulting from exceedances of this standard.

There is strong scientific evidence that exposure to ozone at concentrations at or above the existing health-based federal standard of 0.12 parts per million adversely affects public health. EPA has reported that all of the 95 million people residing in nonattainment areas are at risk of experiencing reduced functioning of the lungs and respiratory infection while ozone levels are at or above the standard.

While some progress has been made in controlling ozone levels and achieving the standard nationwide, we have fallen short in our quest. Not only will many major metropolitan areas not attain the ozone standard by the December 31, 1987 deadline, but for some areas of the country, attainment may be several decades away.

Ozone presents a ubiquitous threat. To effectively address this issue, state and local agencies will be required to maximize the effectiveness of existing programs, regulate previously unregulated facilites, define Reasonably Available Control Technology for a variety of industrial categories and increase monitoring activities. All of these efforts are absolutely necessary in working toward attainment of the health-based ozone standard; they also require significant resources and manpower. At this time, we simply do not have the funds necessary to effectively address this hazardous problem.

Control of small particulate matter, or PM_{10}, is another component of the base program that has been a victim of less-than-adequate funding. Studies show that the health effects associated with exposure to small particulate matter include increased respiratory illness, especially in children, and startling enough, increased mortality.

STAPPA and ALAPCO are pleased that EPA will be promulgating a final PM_{10} standard in the next few weeks. According to agency estimates, there is at least a 95 percent probability that 70 counties across the nation will exceed this new standard. Another 80 counties are considered "too close to call", running a 20 to 95 percent chance of not attaining the standard.

Facing an attainment deadline of three years after approval of a State Implementation Plan (SIP), state and local agencies will be required to assume a whole new set of resource-intensive responsibilites, based upon the severity of their nonattainment problems, to include the development of SIPs, the adoption and enforcement of regulations and the revision of New Source Review requirements. Additionally, every area of the country will be required to install a full network of PM_{10}-specific equipment at a cost that could easily total $2.5 million. While we are anxious to begin aggressive implementation of this new standard, we are, at the same time, concerned that we will be paralyzed by a lack of funds.

Control of toxic air pollution, identified by EPA as one of the air program's highest priorities, is yet another area that continues to be implemented on a "shoestring" budget. EPA has concluded that routine releases of a variety of toxic pollutants may cause as many 1,700 cases of cancer each year, with individual risk running higher than one in 100.

In 1985, EPA developed a strategy for controlling toxic air pollution that relies almost exclusively upon state and local agencies for development and implementation. Accordingly, state and local agencies have been called upon to accept responsibility for delegating and enforcing National Emission Standards for Hazardous Air Pollutants (NESHAPs); controlling high risk point sources of "local" concern; building technical, regulatory and administrative capabilities to implement an effective program through the development and implementation of Multi-Year Development Plans; assessing the health impact of high-risk urban areas; and reducing air toxics emissions resulting from sources and pollutants in these high risk regions. Our citizens are entitled to a comprehensive and effective air toxics program, yet our austere budget prohibits the development of the necessary monitoring networks, emissions inventories, training programs, regulatory capabilities and emergency prevention and response programs.

Today, state and local agencies spend approximately $270 million to operate their air pollution control programs. EPA workload models estimate, however, that the cost of an effective core state and local air pollution control program is $466 million, almost $200 million more than the total funds available to us. And this amount does not include the cost of new and emerging, resource-intensive programs, such as acid rain, indoor air pollution and visibility. Mr. Chairman, Members of the Subcommittee, the members of STAPPA and ALAPCO are responsible for providing our constituents, the citizens of this country, with healthful air. How can we fulfill this obligation with less than half of the necessary resources?

Please understand that we fully recognize that the responsibility for funding air programs is shared by all levels of government. In an attempt to augment federal grants, state and local governments, which provide nearly two-thirds of the resources for air programs, have explored alternative sources of funding, including fee systems.

STAPPA and ALAPCO recently released the results of a survey on permit and emissions fees, which indicate that more and more air agencies are turning to fee programs to supplement their income. I wish to supply a copy of these results for the record. The study showed that thirty-one states and a number of local agencies currently collect fees. Nine of these states obtained the authority to collect fees only within the last four years and four more states are currently developing programs. In addition, during the last two years, at least ten state and local agencies have expanded their fee programs by raising their rates or collecting fees for additional activities.

Fee revenues equal a significant percentage of some air agencies' budgets. In FY 1985 and FY 1986, for example, state air agencies collected amounts equaling up to 51 percent of their budgets and the local agencies that responded to the survey collected amounts equaling up to 83 percent. Aided by additional fee revenue, between FY 1984 and FY 1986, state and local governments increased their contributions to air agency budgets by 15 percent.

Given the success some areas are having with their fee systems, Congress may wish to give serious consideration to the establishment of a national emissions fee program when it reauthorizes the Clean Air Act. However, in spite of the potential fees hold for generating additional funds, significantly more assistance is still needed in order to accomplish the goals of the air program. Therefore, state and local agencies have no choice but to look to the federal government for additional resources.

In addition to increased resources under Section 105 of the Clean Air Act, STAPPA and ALAPCO are also recommending that the Committee consider establishing a national technical coordination center. The complex nature of the many air quality issues state and local air pollution control agencies face today necessitates access to technical information, scientific assessments and regulatory experiences of other governmental agencies. A wealth of expertise is possessed by the technical staff of the more than 250 state and local air quality control agencies across the country. The establishment of a national state and local air pollution technical coordination center to facilitate the exchange of this information, through technical workshops and an information clearinghouse, would greatly enhance the development of effective state and local air pollution control programs across the country.

The lack of resources available to state and local agencies has resulted in a deterioration of core programs for controlling air pollution. Additionally, it has left us without the means to address new and emerging issues. The members of STAPPA and ALAPCO have demonstrated our awareness of this nation's budget deficit by supporting past recommendations for level federal funding. We have worked diligently and in good-faith to cut costs, supplement our budgets and operate efficiently. Unfortunately, every citizen of this country is paying a significant price for our austerity; the health of our entire nation is in jeopardy. We are compelled by our responsibility as air quality officials to request that in FY 1988, air agencies receive a $20 million increase in state and local grants under Section 105 of the Clean Air Act.

I appreciate this opportunity to testify and will be happy to answer your questions. Thank you.

STATEMENT OF DR. WILLIAM E. COOPER, CHAIRMAN, MICHIGAN ENVIRONMENTAL REVIEW BOARD, CENTER FOR ENVIRONMENTAL TOXICOLOGY, MICHIGAN STATE UNIVERSITY, EAST LANSING, MICHIGAN

HAZARDOUS RESEARCH CENTERS

Senator PROXMIRE. Before I call our last witness, I want to make sure one of our earlier witnesses, Mr. David Lester, has not arrived.

Is Mr. Lester in the room?

I take it Mr. Lester is not here.

We will proceed with our final witness, Dr. William Cooper from Michigan State University.

Dr. Cooper?

We are happy to have you here. The Spartans are a great school.

Dr. COOPER. Thank you very much.

Dr. COOPER. I am Bill Cooper, from Michigan State. I am here to speak in behalf of a letter that was sent by Senators Carl Levin and Don Riegle requesting consideration for the $25 million Superfund site that would support hazardous research centers at universities. For the last 12 years, I have been chairman of our Governor's Review Board in the state of Michigan. With both Governors Milliken and Blanchard, I have had the rather dubious honor of running many of the public hearings involved with Superfund sites, incinerators, PVB sites, and have had a lot of kind of pragmatic experiences in not only what it takes technologically to address these problems of toxic chemicals, but also what it takes to get the social acceptability to implement these things through permits and so forth and public hearings.

SUPPORT FOR RESEARCH CENTERS

I am very strongly supportive of the concept of research centers. In this case, the nature of the problems we are dealing with transcends traditional boundaries of engineering or biology or chemistry or economics. We have right now over 60 Superfund sites in Michigan that are federally funded. We have over 1,500 state-ranked sites in Michigan on what we call our 307 State Hazardous Waste Site Evaluation Program.

The technologies that we have to address these are basically moving them from one point to another in terms of reburial, the option to incinerate or the option to air strip in terms of atmospheric release of organics from ground waters.

The problem with these existing technologies is that they are extremely costly and, in many cases, they are socially unacceptable or they are ecologically risky and/or all three of these simultaneously. When one looks at new technologies—and I think we need to do this in the sense that if you look at the total amount of monies with the current technology that we have to clean up these sites, so you can actually recycle them in terms of land use without covenants in terms of use and this kind of thing—we are averaging somewhere probably between $10 and $40 million a site.

At best, in our lifetime, we will clean up in the state of Michigan maybe 30 to 40 of these with combined federal and state funds. Here, we have a list of some 1,500, not all of which are the same ranks in terms of toxicity, but at best we are going to just scrape the surface in terms of actually being able to solve these things, recycle the land, and put them back into active use. By the way, many of these sites are actually industrial sites, which inhibit the industries from relocating at the current sites because they can't afford to rebuild there due to the liability.

And so, these are not just dumps; we are also talking about industrial sites in terms of reuse in downtown urban areas, which is becoming a major problem. The need for centers is basically because of the multidisciplinary aspects of this. You need to have engineering and chemistry and modeling and lab work and field verification. I think it goes beyond just the science; you not only have to develop the new techniques—whether it is biological engineering, whether it is ozone and radiation, whether it is some new kind of incineration—there is a variety of technologies being talked about.

SOCIAL CREDIBILITY

The big problem is getting the social credibility, which means you have to field test these in real life and get good, solid data from credible research units so that the public, in fact, believes that the solution doesn't have higher environmental risks than the problem had to start with.

My belief is that there is a large cadre of experimental type scientists in universities who could be redirected to focus their academic activities in this way, and it would be very cost effective and I think a very timely thing to do.

Thank you.

Senator PROXMIRE. Dr. Cooper, it is my understanding—and I hope you will correct me if I am wrong—that EPA has found that risks posed by so-called hazardous wastes are in the main fairly low, particularly compared to radon, asbestos, and so forth. They cannot justify spending money on university-based centers to study these problems of hazardous waste where the risk is relatively low, and what less important programs should be cut in order to fund those things?

Dr. COOPER. All right. I sit on the Environmental Studies Board for the National Academy. I have for 3 years now, and we reviewed that EPA document before they released it.

Be very careful how you interpret the results of that document. They specifically made the assumption that all the current legislative programs that are currently funded on-line were working. And what they did is extrapolate into the future.

And so, most of those sites, most of those sources of pollutants—like ground water, Superfund—were ones that were ranked low, ones for which they have legislation. And if you could assume the legislation is carried out, and those sites will be mitigated and cleaned up, the risk will be small.

The ones that are high on that list—radon, the indoor air pollutants, the ozone with ultraviolet radiation and skin cancer, et cetera—are the unregulated problems, either because they are international or because they are indoor air pollutants, and nobody has control over indoor air pollutants, either state or federal government.

The point I am trying to make here is that, even though the law says that once you put something on a list, you will clean it up and you will mitigate with existing technologies, the money is not there to do it. And if you are going to address the number of sites we are talking about and you are going to address them in a way that you just don't move the pollutants from one hole to the other, but you actually in some way either neutralize them, detoxify them, treat them, biologically degrade them—we are talking about in site treatment—and technologies hopefully where the cost will be down low enough per site that you can afford to handle the total number that you have identified to date.

If you assume that the Superfund program is not going to clean up, then those ranks in terms of risk assessment would be quite different.

Senator PROXMIRE. Dr. Cooper, I am going to ask that David Schnare, who has studied this carefully—he is on the staff—follow up on this. Go ahead, David.

RISKS ON INDIVIDUAL BASIS

Dr. SCHNARE. Thank you, Mr. Chairman. With regard to the kinds of risks that we are dealing with in hazardous waste sites, the risks on an individual basis are often on the level of 1 in 1,000,000 or 1 in 1,000. However, existing risks for indoor air pollution and radon, as well as risks controlled by long-established programs—for example, the air pollution programs for toxic substances and even the water quality programs—are much higher.

As such, it requires us to look at where best to spend the money; and the question is: What kinds of risks can you see prevented due to the activity of the centers in comparison, for example, with risk being prevented by the Superfund program itself?

Dr. COOPER. I am in the risk assessment business. I am an ecologist, but we get involved with this a lot. A lot of it depends on the time horizons in which you assume exposure from these chemicals. A good portion of the Superfund cleanups are ground water—soils and ground water contamination—old dumps, old landfills, industrial, domestic, you name it.

These chemicals, when they get into the ground water, particularly if it is anaerobic or very conservative, they don't break down very rapidly. They diffuse very slowly, but they last a long time. One of the immediate responses one has when you find a Superfund site is to have alternative water supplies so that the risk goes down. You haven't solved the problem. You just prevented direct exposure.

The question then becomes: Can you afford to use your ground water as essentially mixing zones for pollution blooms, and right off your ground water is a human drinking water source.

Now, I come from a state where we have got 95 percent of the service water in the lower 48 states, called the Great Lakes, Wisconsin and Michigan. We have great alternate water supplies. There are lots of areas in the country where your ground water is a nonrenewable resource; and once you pollute it, from our experience in terms of air stripping and the various kinds of attempts to reclaim ground water, the best you can do is to reduce the pollutants where they don't contaminate further ground water; but you are not going to reclaim them for drinking water standards. So, it not so much a matter of what dead body count you have today; it is what kind of a resource base are you going to have in terms of ground waters for animal and human use for decades to come.

CASCADE OF PROTECTIONS

Dr. SCHNARE. All right. To follow up on this, since we have to look at what are the most cost-effective approaches to dealing with pollution in this society, the pollution of ground water is an inevitable function of man's activities. We can see that, even if we do the very best to control underground storage tanks, a leak in one tank by a cataclysmic event will potentially cause ground water to be polluted. As such, we have a hierarchy or cascade of protections which we use which includes controlling waste, controlling production, controlling use.

In the main, EPA studies have shown that it is far more cost effective to treat drinking water when it is drawn from the ground than it is to try to prevent its eventual contamination, especially in the context of its inevitable contamination. With regard to that, how would the centers which you propose try to alter the balance to make other types of methods more cost effective?

Dr. COOPER. First of all, I guess I would disagree that even though I know the studies, if you have a water supply, it is more cost effective to treat it if you have got a centralized treatment plant; you have still got a very large percent of our population in rural countrysides where they are living off wells with no treatment between the ground water and the user. And we have looked at home packages in terms of treatment plants as one mitigation in Michigan. They only work if they are maintained. If they are not maintained, they are dangerous; and I mean constant maintenance.

And we can't even get our public health department to license those for use in Michigan—home treatment units—because of the lack of maintenance and the guarantee that, in fact, they can stay within acceptable water standards.

So, there is a large part of your population where treatment of the drinking water is not feasible right now. And you don't have surface water alternatives where they are treated in some centralized plant to do it. I guess my feeling is that there are ground waters currently that are already polluted. You are not going to stop that. You probably won't be able to reclaim them to drinking water standards.

The best you can do is to keep the plumes from moving and to keep further sources of pollution from entering the ground water from facilities that haven't yet leaked. Many of these dumps or these landfills, as you call them, will take 20 to 30 years before the pollutants show up. The ones we see today are the ones that started leaking 20 years ago. Ground water moves very slowly. The ones we have built in the 1960's and 1970's haven't started leaking yet. So, you have got some time to respond with alternative technologies. Now, you say: What will the center do? Most of us who have dealt with burial and incineration and air stripping know their limitations. There are economic, there are ecological, and there are social constraints to using all three of those technologies. Superbug, genetic engineering, ozone, ultraviolet radiation, biological concentration on microfilms, clays that absorb to change the ionic concentration of surface of clays that bind with stuff that doesn't move, with barriers underground. There is a variety of technologies being tried in many places. There are bits and pieces.

Even if one of those works in the laboratory, you have still got to get the ecological and social and economic dimensions with it, too, if you are going to expect to license one of those things on the landscape.

Senator PROXMIRE. Dr. Cooper, thank you very much. You have been a very good witness, and I think that was a good exchange that you had with Dave.

Dr. COOPER. Thank you very much.

[The statement follows:]

Statement of Dr. William E. Cooper, Chairman, Michigan Environmental Review Board, Center for Environmental Toxicology, Michigan State University

The problems associated with the safe management of hazardous wastes are complex and constantly changing in character. As chemists develop new analytical capability, the levels of detection are increased and new classes of chemicals are detectable. Furthermore, new chemicals and production processes are constantly being developed for the marketplace. There is no point in time when we can anticipate that the "problem" will be resolved and we can turn our attention to other environmental issues.

Management alternatives must be based on a systems paradigm that includes the wide variety of environmental media (surface water, air, soil, ground water, biota). The processes that determine the transport, transformation, and storage of hazardous substances in the environment involve a complex array of biological, physical, and chemical phenomena. These factors vary with the different geographic regions of the country. Temperature, rainfall, soil type, geology, and ecosystem type are critical constraints on the rates and types of transformation and transport of hazardous chemicals. Ecosystems in hot and dry environments behave very differently than those in cool and wet environments. The field validation of models and laboratory research must be carried out in representative environments that are widely scattered around the country. Thus, similar experiments conducted at various geographic locations are seldom redundant. This has been amply demonstrated by the one-hundred year history of our Agricultural Experiment Stations.

The complexity of the problem requires interdisciplinary teams of scientists involving chemists, microbiologists, soil scientists, engineers, geologists, and ecologists working closely together for extended periods of time. Computer modeling, laboratory experimentation and field validation efforts must be tightly integrated. Research centers organized around existing research faculty at our major universities represent a unique and cost effective opportunity to accomplish this goal. Furthermore, these research activities will present an ideal situation to train a cadre of young scientists skilled in the assessment and management of hazardous substances.

A competitive process of selecting the best collections of researchers in academia who are willing to direct their creative activities towards a problem of national concern has worked very well for NIH and NSF. The research center concept is essential to provide the monetary support and research guidance that will allow the researchers the opportunity to reallocate their time and efforts to focus on a common issue. A critical mass of effort must be dedicated in concert to this important area of environmental research. Research centers are ideal environments to foster multidisciplinary research programs.

EPA is particularly suited as the lead agency for such a Hazardous Substance Research Center. The National Institute for Environmental Health Sciences is initiating a program that primarily emphasises the biomedical aspects with the engineering and ecological components as supporting disciplines. EPA is uniquely capable for the development and assessment of ecological and engineering approaches and new technological alternatives. The social impacts are essential dimensions to maintain the public support for the implementation of new options and are not addressed in the NIEHS program. Landfilling, incineration, and airstripping constitute the majority of treatment alternatives currently available. These are very costly options that often are not theoretically optimum, ecologically sound or socially acceptable.

New technologies involving chemical fixation, microbial bioengineering, thermal transformations, and biological concentration are just a few of the alternatives currently being researched. The emphasis for the development and assessment of new management alternatives is on the engineering and ecological sciences with the biomedical as a supporting discipline. Without the unifying influence of hazardous substance research centers, fragmented approaches and reactive strategies will continue to prevail.

ADDITIONAL PREPARED STATEMENTS

Senator PROXMIRE. We have received a number of additional prepared statements relating to the fiscal year 1988 budget for the Environmental Protection Agency. Without objection, they will appear at this point in the record.

[The statements follow:]

STATEMENT OF SENATOR QUENTIN N. BURDICK

Mr. Chairman. I appreciate this opportunity to share my views with the HUD and Independent Agencies Subcommittee on the Environmental Protection Agency (EPA) FY88 budget request.

This has been an active year for the Environment and Public Works Committee in terms of developing major environmental initiatives and having them enacted. Last June, the Safe Drinking Water Act Amendments of 1986 were signed into public law culminating three years of effort to put in place the first major reforms since the Act was adopted in 1974. Last October, the Superfund Amendments and Reauthorization Act was signed into law, successfully concluding actions that began in 1983 to extend the Superfund program. In February, Congress completed work on the Water Quality Act of 1987 which revamps the sewage treatment construction grant program and expands coverage to previously unaddressed sources of water pollution.

These measures were enacted with nearly unanimous support from both Houses of Congress. However, the real extent of Congressional commitment to these efforts will be measured during the budget and appropriations process. EPA is being charged with major new responsibilities. If funding is not available, the mandates will not be met or they will be satisfied at the expense of equally important ongoing Agency programs. If the President's request for FY88 is followed, the Agency will be operating with a workforce that is 10% smaller than in FY81, exclusive of the Superfund program. The FY88 funding request for research and development is down 24% and the request for abatement, control and compliance down 4% compared to FY81 in real dollars, not taking inflation into account.

Mr. Chairman, the Environment and Public Works recommended to the Budget Committee that EPA's operating budget include $1.650 billion, the level requested from the Office of Management and Budget (OMB). This is a fairly modest increase above the current services level, justified by the Agency's growing responsibilities. We made this recommendation with the understanding that it did not take into account implementation of the new Water Quality Act of 1987. The Agency was unable to provide us with estimates of FY87 and FY88 costs associated with this effort by our reporting deadline. The Agency has committed to providing detailed information in the near future. I urge the Subcommittee to take this information into account when work proceeds on the FY88 appropriations measure.

We further recommended that $1.7 billion be allocated for Superfund in FY88 consistent with the $8.5 billion five-year program established under the Superfund Amendments and Reauthorization Act of 1986. Superfund is largely self-financing through taxes applied to petroleum, feedstock chemicals, imported chemical derivatives and a corporate excise tax. An important component to full funding is the authorized contribution from general revenues at the rate of $250 million annually totaling $1.25 billion over five years. Extensive deliberation and debate went into the formulation of the Superfund financing package. General revenues constitute a significant element of the final House and Senate conference agreement. I emphasize the importance of including this source of funding to meet the full funding level needed to support the ambitious mandates of the Superfund program.

The Water Quality Act of 1987 sets forth a transition plan to turn over responsibility for waste water treatment facility construction to the States by 1995. It is intended that States will establish revolving loan programs over the the next eight years with gradually reduced levels of Federal assistance. $2.4 billion is authorized for this program in FY88. This amount should be appropriated to fulfill the commitment Congress made to the States in enacting the amendments in February. Both the House and Senate versions of the FY87 Supplemental Appropriations measure apply $30 million of construction grant funding to implementation of provisions of the Water Quality Act amendments. Given prevailing budgetary restraints, this is an acceptable arrangement to provide start up costs for new requirements in FY87. This practice should not, however, be repeated in the future. Construction grant funding should be reserved for the purposes authorized under the law and not applied to other programs administered by EPA.

Another area of concern to the Environment and Public Works Committee is the radon research and abatement program. The EPA budget calls for a 50% reduction in funding for this effort in FY88, while much of the research work is transferred to the Department of Energy. This proposal should be rejected. EPA should continue to be the lead Agency with respect to radon work. The Committee has legislation under consideration to expand EPA's role both in providing technical assistance and research in this area creating additional needs for funding.

It is my hope the Environment and Public Works Committee will report a comprehensive acid rain bill this year. Last month, EPA Administrator Lee Thomas testified about the need for acid rain analysis using advanced tracer techniques. Tracking the movement of air pollutants could answer questions concerning the the origin and disposition of acid rain.

Over the past decade, the Aerospace Center at the University of North Dakota has developed sophisticated cloud tracer techniques in connection with cloud seeding experiments. These same techniques could be applied to the analysis of acid rain.

I urge the Subcommittee to allocate $500,000 in Fiscal Year 1988 for acid rain tracer research to be conducted at the Aerospace Center at the University of North Dakota. I understand Mr. Thomas supports use of funds for this purpose.

As Chairman of the Agriculture Subcommittee, I recognize the tight restraints and competing interests the subcommittee faces in allocating scarce resources. EPA funding is a top priority. The public consistently calls for stronger efforts to assure a safer, healthier environment. I hope that my comments are of use as the Subcommittee develops the FY88 appropriations measure.

STATEMENT OF THE ASSOCIATION OF STATE AND TERRITORIAL SOLID WASTE MANAGEMENT OFFICIALS

Mr. Chairman, Members of the Subcommittee, my name is John Taylor and I am Chief of the Land Protection Branch in the Georgia Department of Natural Resources. I currently serve as the President of the Association of State and Territorial Solid Waste Management Officials (ASTSWMO).

ASTSWMO is a non-profit professional association which speaks for the directors of State solid and hazardous waste regulatory and cleanup programs. Situated at the State level, our members have a unique perspective on the problems of waste management. State officials are in constant contact with the individuals who produce and handle potentially health threatening wastes. They are the first to hear the concerns of citizens living near areas of actual and potential contamination.

ASTSWMO's members play an essential role in ensuring that solid and hazardous waste is generated and disposed of in a safe manner. In addition to ensuring State program compliance with federal requirements, State officials must ensure compliance with State solid and hazardous waste management rules. In many instances, these State requirements are more stringent than the federal requirements. In addition to the regulation of hazardous waste, States also contribute funds, staff time, and other resources to clean up Superfund sites and other State sites which do not make the federal list of priority sites; to regulate underground storage tanks; and to regulate non-hazardous waste activities.

I would like to take this opportunity to personally thank your Subcommittee for the significant attention paid to hazardous waste management by Congress in the FY87 Appropriations. And to support continued increases for this growing regulatory program. As we did last year for the President's FY87 proposed budget, State solid waste directors wish to applaud the Administration's FY88 hazardous waste budget request.

The States' need for this money is great. In FY88, States will have assumed many of the new requirements spelled out in the Hazardous and Solid Waste Disposal Act of 1984 (HSWA) and will be actively working to encourage waste reduction, treatment, and alternatives to land disposal. FY88 will see the completion of the joint State/USEPA issuance of operating permits for land disposal facilities; processing and making final determinations on incineration facilities; focusing on closures for units with groundwater contamination; processing permits for new and expanded treatment and incineration capacity, RD&D permit applications, off-site commercial treatment facilities, and permit modifications; routine inspections; and enforcement actions.

In addition to the facility specific efforts outlined above and contained in USEPA's FY88 RCRA Implementation Plan, States encourage your Subcommittee to remember the broader regulated universe: generators and transporters of hazardous waste, as key components of the States cradle to grave responsibilities. ASTSWMO shared with you last year examples of new initiatives covering these 60% of the non-facility RCRA universe and encourages you to review that testimony for detail.

In today's statement, I would like to share with you two important waste management issues in need of your timely support: installation in all States of a new data management system, the

Resource Conservation and Recovery Information System (RCRIS), and increased monies to support training of State regulatory personnel. Investment in both of these items would result in an immediate increase in the efficiency of the limited personnel responsible for this nation's hazardous waste regulation.

RCRIS

For the last year and one half, members of the Association of State and Territorial Solid Waste Management Officials have worked with the National Governors Association to develop a proposal, which has been accepted by USEPA, for a new data management system **RCRIS** to replace HWDMS. As you may know, the data management system currently used by the Agency has not produced the quality of information or the ability to retrieve and use the data needed for oversight and management of this regulatory program. For that reason, most States have elected to develop their own independent computer systems, sharing hard copy data with the USEPA, to monitor the implementation of RCRA. In turn, the OSWER and Congress have been frustrated by reliance on a data management system that does not adequately reflect the current status of the RCRA program necessary for good oversight.

In contrast to HWDMS, RCRIS will offer States effective program management capabilities, flexibility to adapt to State-specific needs, and assurances that USEPA has accurate, timely information on the status of all RCRA waste handlers and on the program's progress. The key to this NGA proposal is the two domain concept; a concept which divides data into implementor and oversight domains. Oversight data, data which will be derived from implementor-specific data, and which will be commonly defined on a uniform national basis, will be routinely transmitted to USEPA. More detailed implementor-specific information, gathered and stored at the State level, will also be available to the Agency upon request. Placing data ownership at that level of government responsible for program implementation and providing the necessary hardware and software to effectively use that data to manage for environmental results will ensure timely and accurate data.

Recommendation: In order to make a rapid and smooth transition to this new data management system early in FY88, monies must be made available to States to purchase hardware and software; to install the equipment; to train State personnel in its use and maintenance; and to clean up HWDMS data for incorporation in the RCRIS data base.
An estimate for this would be $50,000 to $70,000 per State, or $2.5 to $3.5 million.

State Training/Technology Transfer

In the spring of 1986, ASTSWMO established a Training and Technology Transfer Program, guided by a Steering Committee of State Directors and Training Coordinators. Major activities of the program include designation of State Training Coordinators and sponsoring orientation workshops for them; identification of an entry-level training curriculum and development of two major courses (in FY87, for inspectors and in FY88, for permit writers); providing State-to-State training and technology transfer assistance; sponsorship of State technology transfer/regulation interpretation workshops; and cooperation with USEPA and other federal training interests and programs.

State training is the top priority of the Association. Based on surveys of State managers and training coordinators, ASTSWMO has developed a Five-Year Training Plan. The first step in the

Strategy is the development of an entry level curriculum and a delivery mechanism.

Most of the entry level State staff have academic backgrounds in biology, social sciences, or engineering. Few have had applied or regulatory courses. For that reason, State training at this time is "on-the-job." Although this is in many ways an excellent training source, it has become increasingly impractical with rapidly expanding staffs and workloads. For that reason, ASTSWMO, in conjunction with USEPA, is working with universities and academic associations to increase the applied course work available to State professionals.

Institutes: States, in cooperation with USEPA, have set up two Regional Waste Management Institutes (University of Wisconsin and Johns Hopkins University). These two institutes are highly successful. This success is in large part due to their responsiveness to State waste management training needs. Faculty at these institutes consulted with the States on course content, and included significant numbers of instructors with field and program experience from State and Federal government. In addition to the presentations of short courses, these institutes are structured to serve as an on-going learning resource for the participants.

Recommendation: Funding for the development of these regional institutes at present has been a blend of federal and State RCRA monies. By utilizing monies necessary for the implementation of a strong waste regulatory program for training, States are in effect robbing Peter to pay Paul. A line item appropriation by your Subcommittee to finance the establishment of ten Regional University Hazardous Waste Research and Training Centers, as provided for in section 311(a) of the Superfund Amendments and Reauthorization Act (SARA), would provide much needed federal support for State training.

State Officials recommend that an Advisory Council with strong State agency representation, including environment, health and labor programs, patterned after the Council described in S311(a)(5) of SARA be appointed. These regional Advisory Councils would work with the Centers to design State oriented training and technology transfer programs.

Expansion of USEPA's Training/Technical Assistance Expertise: In the late 70s, States relied on inhouse USEPA professionals to provide advice and expertise to State regulatory agencies. The Cincinnati, Ohio and Edison, New Jersey laboratories served as the focal points for this technical assistance. These federal facilities no longer have the funds to provide services to the States (except for the safety and training activities of OERR). Expansion of the Agency's technical capabilities to cover RCRA is critical in order to meet the Congressional mandate of technical assistance to the State delegated programs.

Recommendation: Assure funding targeted at RCRA/CERCLA/UST technology transfer for the Cincinnati and Edison facilities.

In closing, State officials appreciate the recommended increase in State grant funding and agree that the money will be well used to meet the core RCRA program requirements. To complement the steady growth of the regulatory program, State directors recommend a one time funding to install **RCRIS** and monies to support the development and delivery of much needed State training and technology transfer.

Thank you very much for this opportunity to share ASTSWMO's comments on the FY88 Appropriations.

STATEMENT OF HON. PAUL E. TSONGAS

Mr. Chairman, members of the committee, thank you for the opportunity to speak to you today. My name is Paul Tsongas. Over the past year and a half I have been working with the Humane Society of the United States (HSUS) and the Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA) on an issue that holds great promise for extending the frontiers of science. That issue..that hope..is the development of alternatives to the use of animals in research and testing.

Tens of millions of animals are used in research and testing each year in the United States. Some are used in basic research that is dedicated to finding cures for cancer, AIDS, heart diseases and many other illnesses affecting millions of Americans. Some are used in education, serving as models in teaching medical, veterinary and science students about physiology and anatomy. And some 14 million animals a year are used in testing chemicals, substances, pesticides and drugs to determine their effect on humans.

The MSPCA and the HSUS, as well as many other animal welfare organizations, are extremely concerned about the numbers of animals used in research and testing every year in our country. I believe that some such uses are legitimate. There is, however, ample evidence that many research animals lose their lives needlessly in repetitive, duplicative, redundant or archaic research projects. This fact is seen most clearly in testing methods that rely on excessive numbers of animals and methodologies that are often outdated and unreliable. The LD50 is the most notorious and obvious example. The real tragedy is that at times the monies invested in some of these projects not only result in the needless deaths of animals but in the diversion of valuable funds from the development of new methodologies that will advance medical and scientific progress. It is our belief that the reduction of the numbers of animals used in testing through the development of alternatives and the advancement of good science are compatible goals.

In a report issued in February, 1986 by the Office of Technology Assessment (OTA), the issue of alternatives to the use of animals in research, testing and education was explored in depth. It is in the area of testing of potentially toxic substances and pesticides that the OTA Report detected the greatest hope for both the reduction in number of animals used and the advancement of science.

It is the subject of alternative methods for testing toxic substances and pesticides that I would like to address today. Toxicity tests try to determine whether chemicals are safe for human use and the limits under which hazardous chemicals can be used safely. Routine testing of new substances examine the general effects of a single dose (acute toxicity) or repeated doses (chronic toxicity) or specific effects such as induction of cancer (carcinogenicity), genetic damage (mutagenicity) and congenital malformations (teratogenicity).

WHAT ARE "ALTERNATIVES"?

What is meant by the term "alternatives? Alternatives, as used by the OTA in its 1986 report, are defined as the three Rs: replacement, reduction, refinement. It is this broad definition to which the HSUS and MSPCA subscribe.

Replacement is the substitution of a non-animal model for an animal model. An example is the canine cardiopulmonary resuscitation simulator, know as Resusci-Dog, which is substituted in some research projects for live dogs. Another is the replacement of whole animals by cell, tissue, skin, or organ cultures in *in vitro* testing of various chemicals and substances. The substitution of an invertebrate animal (horeshoe crab) for a vertebrate animal (rabbit) is also a replacement method.

Reduction is the use of fewer animals in a test project. For example, one test frequently used by research facilities to test various substances is the Lethal Dose 50, (the LD50) in which a large group of animals, usually 30 to 100, are exposed to increasing doses of a particular substance until 50 percent of the animals die. New more sophisticated testing methods allow for as few as 4 to 10 animals to be used, thus reducing by almost tenfold the number of animals that are doomed. Using various tissues from one animal for use in a multitude of tests rather than the whole animal for only one test have also led to significant reductions in the number of animals used. A single rat liver, for example, could supply enough cells to replace dozens of animals used in conventional tests.

Refinement is the term used to describe the minimizing of pain and distress the animal must endure while undergoing a research protocol. This can be achieved by the proper administration of pain killers, tranquilizers and anesthetics to the research animal before, during and/or after the experiment. The term also includes use of non-invasive techniques that provide for early detection of tumors or changes within the animal to lessen the suffering or to provide for early euthanasia.

In recent years there has been significant progress in the area of alternatives development. What follows are a few examples of such alternatives:

> The Limulus Amebocyte Lysate (LAL) test, developed at Johns Hopkins University, uses the blood of horseshoe crabs to determine whether drugs injected into humans would cause a fever. The test does not harm the crab and replaces an older test that killed at least three rabbits each time it was performed. The LAL test is believed to save the lives of approximately 3 million rabbits annually. The LAL test is considered over 1000 times more sensitive than the rabbit tests.
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> A test that uses the outer membrane of chicken embryos to determine if substances are harmful to the eye is being developed by researchers at the Medical College of

Pennsylvania. The technique is thought to involve no pain because the membrane has no nerves. This test would replace the Draize eye irritation test in which substances are sprayed or dropped into the eyes of live rabbits.

Short term cell culture tests are used by the FDA to determine which drugs administered to food-producing animals pose a risk of carcinogenicity.

Researchers at the University of Texas have developed a computer model that can simulate the effect of drugs on dogs. This program has saved the university $18,000 over the last five years and has spared the lives of about 240 dogs.

In human pregnancy testing, a diagnostic kit that contains chemical materials to screen a mother's blood or urine is now considered more reliable than the use of rabbits.

A simple test for detecting teratogens (chemicals that cause birth defects) has been developed using hydras (living sponges) and promises to be far more reliable than teratogen testing on animals.

The Ames test uses bacteria or, alternatively, liver enzymes, to detect mutagens (genetic damage) and gives results comparable to those of animal tests. It is cheaper, quicker and more susceptible to refinement and improvement than standard animal tests. Used together with a battery of other short-term tests, it appears to have a high degree of reliability

Among others, in vitro research has led to breakthroughs in cancer research (development of oncogene theory and monoclonal antibodies), in detecting chemicals that cause photosensitivity reactions in humans, in diagnosing infant botulism, in advancing our knowledge of the human immune system, and in understanding the biochemical basis of depression and mania.

The examples cited above are important not just because they have saved many animals from death. The are also making a critical contribution to the health of human beings.

WHY IS THERE A NEED FOR ALTERNATIVES?

Take the testing of cancer-causing substances--or carcinogens--for example. Currently, the most widely used method of testing for carcinogens is the whole animal bioassay, lifetime feeding studies in rats and/or mice using maximum tolerated doses of the test compound. The cost of performing a single test through the whole animal bioassay ranges from one half million to two million dollars and takes three to four years to complete. The costs of animal procurement, housing, and feeding, as well as staff costs for animal care, veterinary services, and other items combine to make such whole animal bioassays extremely expensive.

In addition to being costly, the results of these tests may not always be directly applicable to human beings. Both aspirin and vitamin A have adverse effects on animals but not in human beings. Beta napthylamine is carcinogenic in human beings but not until 1982 was carcinogenicity indicated in a rodent test. That is why the 1985 EPA report on Alternative Methods admitted that "all toxicity testing methods, including both animal and in vitro tests, share a common problem--questions about the ability of test results to be extrapolated to human health considerations."

In addition, there is some question as to the validity of whole animal bioassay test results. According to H.R. Hertzfeld and T.D. Myers, contract contributors to the OTA Alternatives Report, "It is concluded that the lifetime feeding study has never been subjected to proper validation as an assay for human carcinogens. When an attempt is made to validate it on the basis of these reported studies and those in the literature, it appears to lack acceptable specificity and sensitivity. It is suggested that a drastically different design is needed and that such redesigning of the assay will require proper validation."

Dr. David Salsburg of Pfizer, Inc., in a paper published in Fundamental and Applied Toxicology (Jan./Feb. '83) which attempted to examine the validity of lifetime feeding studies in mice and rats, found that the studies "appear to have less than a 50% probability of finding know human carcinogens. On the basis of probability theory, we would have been better off to toss a coin." There are some in the scientific community that dispute the Salsburg Study but the questions he raised remain. Clearly, sufficient evidence exists for the proposition that both in vivo and in vitro results should be tested against each other to assess the accuracy of various testing and research methods.

In addition to being costly and of sometimes questionable reliability, whole animal bioassay testing is extremely time consuming--again requiring three to four years to complete. This fact is particularly salient--and frightening--when one considers that there are tens of thousands of potentially toxic substances and pesticides now in use that have never been adequately tested. This backlog is further aggravated by the approximately 500 new chemicals added to the market each year.

The urgent task of clearing out the backlog of untested chemicals and pesticides would take billions of dollars and several decades using current whole animal methods. Current funding levels permit only about 200 tests per year at an annual cost of $200 million.

On the other hand, a battery of short term _in vitro_ tests costs in the neighborhood of $30,000 per substance tested. Given current resources, around 7000 substances could be tested annually, using such methods. This would eliminate the backlog of untested chemicals and pesticides within seven years and allow agencies to stay current with new chemicals production. Further development and refinement of _in vitro_ tests could eventually allow costs and the time frame for testing to decrease and allow for even quicker and more reliable results. At the very least, short-term tests could be used immediately to screen out the more toxic chemicals currently in use.

WHAT IS BEING DONE TO ADVANCE THE DEVELOPMENT OF ALTERNATIVE TESTING METHODS?

Progress in the development and acceptance of new alternative testing methodologies, however, has been slow. Why is that? According to the 1986 OTA report on alternatives, "The implementation of alternatives is hindered by various forms of institutional inertia, such as regulatory schemes, product liability law, and general resistance to change." Hertzfeld and Myers went further in stating "Regulatory authorities tend to follow, not lead, in accepting new technologies, and they are heavily influenced by the industrial concerns now in place. Economic realities eventually prevail, but the short-term turmoil in the industry and regulatory agencies will be painful to many. The danger is that a new technology that could lead to significant social benefits will be adopted with a long delay (and increase social costs by a large degree) because of political and institutional barriers. Congress and the government should be alert to these possibilities."

Over the past eighteen months the MSPCA, the HSUS and I have met with various representatives of the National Institutes of Health, the Food and Drug Administration, the Environmental Protection Agency and the National Toxicology Program to assess the efforts of these agencies in the funding of the development of new alternative methods of testing. Through our meetings we have had the opportunity to talk to many dedicated professionals who have a great deal of interest in the development of new methodologies that reduce the number of animals used or replace whole animals with other models or methods. In some cases, we have also heard frustration expressed at the lack of both funding and institutional support for these new projects.

Attempts to quantify the exact amount of funding by federal agencies for new methodologies, whether intramurally or extramurally, have not been altogether successful. While all of the involved agencies devote some resources to alternative methodologies, the bulk of such funds appear to be directed to the programmatic use of current alternative techniques rather than the development of new ones. Both need to be given attention.

According to testimony given by Dr. James Willett of NIH before the House Subcommittee on Science, Research and Technology in May of 1986, NIH devotes approximately 27 percent of the agency's entire portfolio to activities that employ nonmammalian systems. However, funding for new activities in alternative development amounts to less than $1 million. That's less than a fraction of 1 percent of the agency's budget.

Under P.L. 99-158, the Health Research Extension Act of 1985, Congress directed NIH to establish a plan for the development and implementation of research methods that do not use animals, methods that reduce the number of animals needed, and methods that reduce the levels of pain and distress in animals when used in research. The Trans-NIH Coordinating Committee for Research Animal Resources (CCRAR), which worked on the development of this plan, concluded "that while NIH spends considerable monies on projects that do not use animals, there is no focused program to develop non-animal models for research."

This statement could apply almost uniformly to all governmental research agencies. At the same hearing, Dr. David Rall, Director of the National Toxicology Program and Director of the National Institute of Environmental Health Sciences, stated that of NTP's $80 million budget, only $2 million was spent on new grant applications on nonmammalian species and toxicological testing. Under Dr. Rall's leadership NTP has made great strides in employing alternative methodologies. The development of new non-animal bioassays is not NTP's current mission. But some agency must undertake this all-important task.

I believe that agency should be the Environmental Protection Agency. After all, it is EPA that has responsibility for administering both Toxic Substances Control Act (TSCA) and

Federal Inscticide, Fungicide, Rodenticide Act (FIFRA). The Office of Research and Development at EPA has the resources to undertake an extensive program not only to use current alternative methodologies but to develope new ones.

Last year, this Subcommittee, in Report 99-487, provided a specific charge to EPA in this area. It read:

> "The Committee understands that approximately $16,000,000 of the total research and development budget is being used to develop and validate alternative toxicity testing methods. EPA had the responsibility for the testing of substances found in the environment which may have adverse human health affects in order to develop standards which provide a foundation for the Agency's regulatory activities. Thousands of potentially harmful substances have not been tested before human exposure because of the cost and duration of the testing required to develop toxicological data."
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> "The Committee directs that the $16,000,000 be used to support basic research designed to produce testing alternative including cell, tissue, and organ culture technology, to improve experimental design and statistical analysis of result, and for computer simulation of living systems. The specific objectives of these activities should be to: (1) develop more efficient and economical methods of testing without a loss of statistical accuracy; (2) target specific tests for which alternative would be most desirable; and (3) eliminate unnecessary animal testing."
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> "The Committee recognizes the Agency's effort to reduce the number of animals involved in health effects testing and research. The Committee expects these activities to continue next year, particularly those charged with evaluating alternative to whole-animal testing. Moreover, beginning with the fiscal year 1988 budget request, the Committee directs the Agency to provide a summary of each

research activity that is related to the evaluation of whole-animal testing and substitutes for whole-animal use and related research."

EPA's response to your charge indicates that it spends $15.6 million in the areas of in vitro genetic tests, in vitro non-genetic tests, structure-activity relationship tests, and computer-generated models and extrapolation modes. However, the report does not indicate what portion of that amount is used for new alternatives development and what portion is being spent simply to employ currently accepted alternatives for the testing of substances. Once again, it is the area of new alternatives development that is critical to solving the pressing need for cheaper, quicker and more reliable methods of testing substances for potentially toxic effects.

WHAT CAN CONGRESS DO TO PROMOTE THE DEVELOPMENT OF ALTERNATIVES?

What can the Congress do? I believe the most important task is to spur the development of new alternative methodologies, especially in the testing of toxic substances and pesticides. We are not talking here about some fanciful future scientific advance. Alternatives are already here and they are here to stay. They are already saving the lives of many animals and by pushing the frontiers of science, they promise to save many human lives as well. But more can and should be done. While old techniques must be refined and validated, new ones must be developed.

I would propose that Congress take several actions-none of them particularly costly--to advance the development of alternative methodologies.

First, EPA should be mandated to allocate increased resources from its research and development budget to such new methodologies development. An extramural competitive grants program to encourage further research in alternatives development would mark an important auxiliary step in the right direction. The Johns Hopkins Center for Alternatives to Animal Testing, for example, is the umbrella entity for many of such researchers. It is underfunded and could benefit in important ways from such a program.

Second, there should be some agency that is specifically charged with coordinating the development of new alternatives throughout the government. Such a coordinating body would articulate a general federal policy on alternatives to animal toxicity testing and would formulate guidelines on the development and adoption of alternative methods. It would periodically review all toxicity testing methods so that more reliable data can be obtained. It would have as a major part of its mission the continued assessment of agency-wide new alternative methods development so that duplication is avoided and real progress is encouraged. It would also serve as an alternative methods data clearinghouse so that the extensive literature in the field can be surveyed and disseminated. Most important, by providing a locus for alternatives development coordination, a committed force will be created that will cut against the institutional inertia and resistance that many believe holds back greater progress in developing alternatives. Rather than establish a new agency, I would suggest placing this responsibility within EPA, where it most logically belongs--perhaps within the Office of Policy, Planning and Evaluation.

Third, I would urge you to encourage all federal agencies to develop plans for alternative technologies. Dr. Gary Ellis, who served as project director for the landmark OTA report, rightly commended Congress for directing the NIH to develop such a plan. He feels that a similar directive to EPA, FDA and other federal agencies is warranted. Ellis states that this directive would be "helpful at two levels. One, it lets the Congress know what the agencies are doing. Two, it forces the agencies, just as it forced NIH, to take stock and to focus their attention in-house on this issue." Within every agency, there are scientists, researchers and policymakers who are committed to the development of alternatives. Their commitment is based less on animal welfare concerns than on their knowledge that alternatives are "good science", that they hold great promise for advances in human health. By nudging the agencies in which they work to devote additional attention and resources to this important endeavor, Congress will be giving them the tools they need to achieve success.

STATEMENT OF DR. D. JAMES BAKER AND DR. JOHN L. KERMOND ON BEHALF OF THE JOINT OCEANOGRAPHIC INSTITUTIONS, INC., AND THE MARINE DIVISION OF THE NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND GRANT COLLEGES

Mr. Chairman, and members of the Subcommittee, thank you for the opportunity to testify on the 1988 Budget request for the National Science Foundation (NSF). We are D. James Baker, President of Joint Oceanographic Institutions, Incorporated (JOI), a consortium of the ten largest academic oceanographic institutions in the United States, and Dr. John L. Kermond, Director of the Marine Division of the National Association of State Universities and Land Grant Colleges (NASULGC), representing 149 institutions throughout the 50 states of the Union. Our institutions strongly support the President's budget request for increased support for U.S. basic research. We believe that a vigorous basic research program is key to a viable and independent economy, to our nation's competitiveness, and to our society's health and well-being.

We fully share the Office of Management and Budget (OMB) position that the nation's future position in global markets will depend upon the generation of new knowledge, and the timely and effective transfer of this new knowledge to specific applications. The university community has been in this business for quite some time, and the partnership developed between the federal government, the universities, and industry in general, has given this country much to be proud of, and much to look forward to.

The FY88 National Science Foundation (NSF) budget will renew the commitment to scientific and technological excellence. American leadership in science and engineering has given us the technological innovations that have formed the basis of an economy that is still the envy of the world. In fact, since World War II, new technology has been responsible for nearly half of all productivity increases — more than any other single factor. However, productivity has declined in relative terms, and certainly pales with respect to the productivity rates (from 1973 to 1983) in Britain, France, Germany, Japan, and Korea.

Success in any effort to improve the nation's productivity will be largely dependent on a sound and robust science and technology enterprise. Of this, the academic basic research system — highly educated and motivated people, strong institutional support, and modern laboratories and equipment — will be critical. Fortunately, the NSF budget does reflect a long-term commitment to significant growth in research and education activities in science and engineering, especially in the nation's colleges and universities.

In this regard, we do wish to endorse the recommendations of the White House Science Council's report on the health of U.S. colleges and universities ("A Renewed Partnership", February, 1986). The report called for major investment in the nation's centers of learning to overcome deficiencies created by low or no growth in R&D funding, by slowed growth in personnel support, and by inadequate funding for laboratories and instrumentation. The NSF Director, Erich Bloch, is to be lauded for adopting much of the above report recommendations as the basis for his FY88 submission, and for proposing the doubling of the NSF research and education budget within 5 years.

In similar fashion, we would like to bring your attention to the matter of university facilities and the decline (95% in real terms during the past 20 years) in federal investment in university research buildings. The Packard-Bromley report recommended a ten-year, competitive, matching grant program funded through the NSF at $500 million per year. H.R. 1905, the "University Research Facilities Revitalization Act of 1987" has already been introduced, and is generally consistent with the White House Science Council's recommendation. We urge you to support it. If we are to renew our commitment to American science, technology, and engineering, we must provide both equipment and facilities adequate to the task.

With respect to the Geosciences directorate within NSF, the proposed budget increase of 15% (to $330 million) is highly recommended. NSF accounts for almost two-thirds of the total federal support in atmospheric, earth and ocean sciences. The major research focus in the Geosciences is the Global Geosciences Initiative. The FY88 budget request provides a $24.6 million increase. The goals of the initiative are to understand how the earth functions as a system, and to describe cause and effect relationships among the processes of the global environment. Such problems as the hole in the ozone, climatic changes due to the El Nino, global warming caused by carbon dioxide and other gases, and geological and geophysical processes ranging from earthquakes to undersea volcanoes are all being studied with new techniques and ideas thanks to this initiative. Together with input from other agencies such as NASA, NOAA, and the Office of Naval Research (ONR), the NSF support offers hope of real progress in global understanding and prediction.

Further, the Global Geosciences initiative has led to new international programs to understand our environment. The International Geosphere-Biosphere Program (IGBP) is operating under the International Council of Scientific Unions (ICSU). In the United States, interagency planning has taken place under the Ocean Principals, and will be strengthened by a new group just appointed by the President's Science Advisor. We are pleased that this new Committee on Earth Science will be part of the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET). The National Academy of Sciences has put in place a Committee on Global Change, designed to be the U.S. committee for IGBP. We look forward to the success of these new groups in integrating national programs on this important topic.

Mr. Chairman, if we are to understand the earth, its natural changes, and the effect of mankind, then we need new initiatives like the NSF Global Geosciences. The President's budget recognizes this need, and **we fully support the overall FY 1988 budget request for the National Science Foundation.**

We also strongly support the general principle that the budget of the National Science Foundation should be authorized for a period of at least five years, and that its budget should be doubled over that period. Successful basic research requires long-term support, and a five-year authorization is an essential step in that direction. Such long term support has proven highly successful in other countries, such as Japan, where their global competitiveness has grown remarkably in recent years.

In closing, we want to thank you again for the opportunity to testify before the committee. The issues we have addressed are important not only to higher education, and not only to the academic marine research community whom we represent, but to all Americans concerned about the economic and social future of our children and their children. We especially applaud the NSF efforts to strengthen programs at the elementary and secondary levels, and the improvement of teacher preparation, instructional materials and technology, including science and mathematics curricula. The FY88 NSF budget request, we believe, is equitably and fairly balanced between the three main themes of education and human resources, science and technology, and disciplinary programs and facilities. **We urge your adoption of the total NSF budget request for FY88.**

STATEMENT OF THE NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS

Mr. Chairman, members of the subcommittee, my name is Ernest C. Shea. I am the Executive Vice President of the National Association of Conservation Districts (NACD). NACD represents 2,940 conservation districts across this country and the more than 15,000 women and men who make up their governing boards.

I appreciate the opportunity to provide you with NACD's recommendations for fiscal year 1988 appropriations for the U.S. Environmental Protection Agency (EPA). Today I would like to focus my remarks on the funding needs for EPA's nonpoint source pollution management activities. The agency's operations budget will play a key role in how our natural resources are managed in the future. Earlier this year, Congress passed amendments to the Clean Water Act which included a program for reducing pollution from nonpoint sources (NPS). NACD urges you to appropriate $70 million for NPS management as authorized.

It may be helpful at this juncture to clarify why America's conservation districts are so interested in this new program. As EPA and states implemented the Section 208 program in the late 1970's, 39 states designated soil conservation agencies as the lead agency for developing agricultural nonpoint pollution control plans. These agencies in turn utilized conservation districts to develop local elements of the state plans. Districts were to be the local implementing agency, had the 208 program been completed. Given this history, NACD fully expects conservation districts to play a pivitol role in implementing the NPS management plans required by the 1987 amendments.

The NPS management programs will be developed and implemented by state governments with oversight and financial incentives from EPA. These NPS programs will provide an integrated, national program to overcome the existing major impediments to achieve water quality goals. The program comes on the heels of a major new soil conservation effort mandated by the the 1985 Farm Bill. However, NPS management goes beyond just erosion control on agricultural land. In addition to reducing sediment loading of the nation's waters, NPS management plans will also be addressing problems associated with organic and inorganic nutrients; animal wastes; sediment from other land types such as range, forest and urban; natural pollutants such as salts; and manmade chemicals. Districts are already heavily involved in overcoming these resource problems.

NACD believes that it is very important to follow through and implement this new NPS program. In order to do so, however, it is crucial that all authorized funds be appropriated. The Section 208 program of the late 1970's provides us with a useful example of what can happen to a program which is authorized but not funded. Section 208 was our first attempt at addressing pollution from nonpoint sources. At that time, state and local governments spent a great deal of time, energy, and money to develop plans to address NPS problems within their jurisdictions. EPA helped finance that planning process and was to share the costs of implementing those plans. However, implementation funds were never appropriated. As a result, many state and local governments felt that an agreement had been broken. It is critical that we not repeat that same mistake.

As you consider appropriating $70 million for the NPS management program, there is one last item I would ask you to keep in mind. NACD and our member districts do not wish for this program to be another opportunity for more planning. It is our view that using monies authorized under this section for extensive planning purposes would be an inefficient use of federal funds.

The 208 plans that are on the shelf today can be used as a blueprint for implementing NPS management strategies. These plans, along with updated water quality reports, will enable conservation districts and state governments to move quickly in implementing comprehensive NPS management programs.

Conservation districts stand ready to implement the identified best management practices on all land types. We feel that by combining state and federal financial assistance programs, soil conservation provisions of the 1985 Farm Bill, and directions of state NPS plans to treat critical watersheds, we can improve water quality quickly and dramatically.

State and local governments have moved ahead with their own efforts to improve water quality by controlling nonpoint sources. Federal agricultural programs are now operating to reduce soil erosion from our most highly erodible cropland. Section 319 of the Clean Water Act Amendments gives us the opportunity to gather all these efforts into one cohesive, national program to improve the quality of our nation's water. I urge you to appropriate all authorized funds to ensure success of this effort.

Thank you for the opportunity to share our views on this important topic.

STATEMENT OF THE COUNCIL OF ENERGY RESOURCE TRIBES

The Council of Energy Resource Tribes greatly appreciates this opportunity to present our views on the Fiscal Year 1988 request for appropriations for the U.S. Environmental Protection Agency. Collectively, the 43 tribes that comprise the Council of Energy Resource Tribes govern an area of the contiguous United States that is much larger than all of the New England states combined.

The nation's original environmental laws contemplated a federal Environmental Protection Agency that would establish federal standards and guidelines for the protection of various environmental media, and that would monitor and enforce compliance with these guidelines among the various states and federal agencies. Actual day-to-day administration and enforcement, however, were contemplated to be the province of the states themselves, and of the federal agencies exercising jurisdiction over federal lands and enclaves. Overlooked in this otherwise efficient and perfectly sensible division of responsibilities and authorities were the Indian lands of the country, where the states generally do not have either civil or regulatory jurisdiction, and where the federal agencies have neither the manpower nor the expertise to administer these programs.

Recognizing these significant lacunae in the administration and enforcement of the nation's environmental laws in Indian country, the 99th Congress began to make express provision for the extension of these laws to those Indian lands. In amendments to the Safe Drinking Water Act, and the Comprehensive Environmental Response, Compensation, and Liability Act, the 99th Congress authorized the Administrator to treat Indian tribes as states for the purposes of assuming primary regulatory and enforcement authority in implementing these laws on their respective reservations. Similarly, the 100th Congress, in amendments to the Clean Water Act, has provided similar authority to the Administrator and to tribes for purposes of extending the benefits of this law to Indian country.

In each of these instances, the Congress further recognized that for many years, these laws have not been adequately enforced or implemented in Indian country, and made provisions to bring these programs in Indian country up to the level that has been achieved in the rest of the country. Accordingly, in each of these statutes, the Congress has directed the conduct of surveys and/or inventories of environmental conditions on Indian land, to be reported to the Congress along with recommendations for ameliorative or remedial actions that are needed.

Thus, the Safe Drinking Water Act Amendments of 1986 required the Administrator to conduct a survey of drinking water on Indian reservations, identifying drinking water problems and the need, if any, for alternative supplies. P.L. 99-399, Sec.302(e). The Senate Report accompanying this legislation made clear the purpose of this provision: "There is concern that there may be a disproportionate incidence of water borne diseases on reservations." S.RPT. 99-56, p. 23 (1985). Similar requirements for surveys of existing conditions on Indian lands, and reports to Congress, are found in the Superfund Amendments and Reauthorization Act, P.L. 99-499, Sec. 126(c); and the Clean Water Act Amendments, P.L. 100-4, Sec. 518(a).

The 43 federally recognized tribes of the Council of Energy Resource Tribes have been distressed to learn that the Environmental Protection Agency, which supported these Indian amendments in Congress, has not only failed to request any funds to conduct these surveys and inventories in Indian country, but has indicated in a number of meetings that the agency simply does not want to undertake these efforts.

In fact, the Council of Energy Resource Tribes was particularly distressed to learn that EPA has commissioned a review of and extrapolation from a study we performed on 25 selected reservations a number of years ago, in an effort to document the preconceived conclusion that such a survey is not required with respect to surveying hazardous waste sites on Indian reservations.

We share the agency's conviction that these are daunting assignments; but we also share the Congress' conviction that these discovery exercises would have been conducted on our lands years ago, but for the fact that our unique jurisdictional status was simply overlooked when these laws were first enacted.

We do not minimize the magnitude of the task before us, nor the fact that the ultimate cost of conducting these surveys and inventories may well run into the millions of dollars. We do believe, however, that our lands, where our people live, are no less worthy of the protection of the nation's environmental laws than the public lands, Forest Service lands, and other private lands of the country. We are not asking that these massive efforts be accomplished overnight, nor even within a single fiscal year. We are requesting, however, that the work which the Congress has directed be begun, and begun in an orderly manner that presages completion within a reasonable time.

We greatly appreciate the concern of the Congress that is represented in these recent Indian amendments to these three important, national environmental laws. And we especially appreciate the assistance that many members of this Committee provided to us in our efforts to extend the protection of these laws to our lands. If the agency charged with implementing these laws, however, is allowed merely to give lip service to the importance of Indian country, but avoid the actual work by hiding behind the appropriations process, we will all have won a hollow victory, indeed.

For these reasons, the 43 tribes of the Council of Energy Resource Tribes urgently requests this Committee to direct the Administrator of the Environmental Protection Agency to undertake the surveys and inventories of environmental conditions and hazards on Indian lands, and in consultation with the Director of the Indian Health Service and the Secretary of the Interior as these statutes require, to make the required reports to the Congress.

Although the Council of Energy Resource Tribes represents only more than one-half of the Indian land in the country, we have no doubt that our concerns in these matters are shared equally with the more than 200 Indian tribes in this country that are not members of CERT. There is no greater concern that any level of government can have than that for the health and welfare of its citizens and residents, but there are other concerns as well.

The President himself, in his Indian Policy Statement of 1983, made it clear that the development of reservation economies toward the end that Indian people can end their dependence on federal assistance and subsidies is a centerpiece of his Administration's policies. Yet, by his agency's refusal to implement the law of the land with respect to hazardous waste sites, drinking water supplies, and clean water, even he is consigning our people and our lands to a perpetual state of underdevelopment and a condition of repelling investment and development opportunities.

Ours are about the only lands remaining in the country about which a proposed development or other economic venture can find virtually no information regarding the environmental suitability of locating on a reservation. If the Congress of the United States is concerned that there is a disproportionate incidence of water borne diseases on our lands, you can imagine what that concern does to the investment climate on our lands.

The Council of Energy Resource Tribes has, from its inception, been dedicated to the proposition that we do not have to sacrifice the habitabillity of our lands as a cost of developing them. It is for precisely that reason that the CERT tribes have worked so diligently for so many years to secure the benefits of these recent amendments to our environmental laws. It never occurred to us that the legislative victories we have so recently celebrated could prove so hollow so quickly.

Over the years, we have enjoyed a marvelous and constructive relationship with EPA's Office of Federal Activities. Working with that office, we have seen the agency adopt not only an Indian Policy Statement that we greatly applauded, but also an implemenetation strategy to give that policy meaning on the ground throughout Indian country. We are requesting this Committee not to allow the budget-driven program offices of the agency to set back the clock with respect to the relationships that have been established, but, instead, to direct those offices to work with EPA s Office of Federal Activities to consult with Indian tribes, as the law requires, in developing a workable schedule for implementing the recent Indian amendments to these environmental laws.

This Committee's assistance in providing this direction to EPA in clear and unmistakable terms will be greatly appreciated not only by the 43 member tribes of the Council of Energy Resource Tribes, but by all the nation's Indian tribes as well. As the Congress

recognized long ago in devising the scheme for the protection of our national environment, there can be no environmental protection for any of us until there is environmental protection for all of us. We look forward to your assistance in this important matter.

Thank you very much for your time and consideration.

STATEMENT OF THE ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Mr. Chairman, Members of the Subcommittee:

This testimony is offered on behalf of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). ASIWPCA represents the perspective of the State Water Quality Administrators relative to funding for the newly reauthorized Clean Water Act.

The Association commends the Subcommittee for its continued interest in and strong support of State Clean Water Programs. In particular, Mr. Chairman, we appreciate your efforts in FY 87 to maintain financing for municipal wastewater treatment and Section 106 State Management Assistance.

ASIWPCA is the national, non-partisan, professional organization of State officials, who on a daily basis implement the Clean Water Act and numerous other environmental statutes dealing with surface and groundwater quality.

As professionals, ASIWPCA members are committed to the Clean Water Act objectives and urge the Subcommittee to fully fund the Municipal Construction Grant Program for wastewater treatment facilities at the authorized $2.4 Billion. This funding is essential to achievement of the municipal compliance deadline (July 1, 1988) and initiation of the transition to self-sustaining State Revolving Loan Funds.

The Subcommittee's support of the Clean Water Program is needed now, as never before.

> Delegation — As you know so well, under delegation States are the principal managers of the Clean Water Act, responsible for the majority of the workload associated with implementation including:
>
> .. comprehensive planning and water program management,
> .. groundwater protection,
> .. standards setting,
> .. monitoring,
> .. toxics control,
> .. permit issuance, and
> .. enforcement.
>
> Transition — An effective, stable funding transition is essential to implementation of the Water Quality Act of 1987 and initiation of self-sustaining State Revolving Loan Programs.
>
> Workload — National program requirements have increased, particularly for groundwater protection, toxicity elimination, stormwater control, and nonpoint source abatement. States urge the Subcommittee to carefully examine the options available to address the workload associated with the new statutory requirements and provide adequate resources to implement the law, within the current statutory authority.

Efficiency -- With a plethora of new, as well as existing, Federal Clean Water Act requirements and regulations, the States call upon the Congress and the US Environmental Protection Agency to place greater emphasis on management efficiency and the elimination of duplicative activities. Precious Federal, State, and local resources should be directed (and in some instances shifted from existing program activities) toward achievement of environmental results and natural resource enhancements, rather than bureaucratic paper shuffling, excessive oversight, and programmatic duplication of effort.

For example, increased attention must be paid to the: 1) development of individual State toxic control strategies, 2) initiation of enhanced bio-assessment programs, and 3) expanded implementation of stormwater, nonpoint source, and groundwater control programs. Existing data secured under the Section 303(e) and 208 programs along with ASIWPCA's "America's Clean Water, the States' Evaluation of Progress", and "America's Clean Water, the States' Nonpoint Source Assessment" should serve as the foundation for instituting these new programs. Accordingly, there may well need to be a decrease in emphasis for some existing efforts, e.g. the Advanced Treatment Review Process.

Municipal Financing

States urge the Subcommittee to fully fund the Construction Grant Program at $2.4 Billion. These funds are essential to achievement of our national water quality goals. For example, the results of a recent Association membership survey indicate the following:

* Compliance Needs -- In excess of 1700 municipal projects with an estimated cost of $13 Billion require Federal funding assistance in order to achieve the July 1, 1988 municipal enforcement deadline for secondary treatment;

* FY 87 and FY 88 Impacts -- In excess of 570 municipal projects are in danger of falling into noncompliance with the July 1, 1988 deadline unless Construction Grant funds for FY 87 and FY 88 become immediately available; and

* Revolving Funds -- 12 States have indicated that they intend to utilize grant funds in FY 88 to initiate State Revolving Loan Funds. Early use of the funds for the State Revolving Loan will allow maximum fund capitalization.

Section 106 State Management Assistance Grants

ASIWPCA appreciates the Subcommittee's strong support of the State management grants authorized under the Section 106 water program grant. The increased workload envisioned by the new legislative mandates will place a tremendous number of new requirements on States administering National policies, and we therefore urge that Section 106 be appropriated at the level authorized by the Act.

Mr. Chairman, it has long been the position of the State Water Quality Managers to discourage specific set-asides of funding from the Construction Grant Program or the State Management Grant under Section 106.

It is a reality, however, that additional funding for the States and US EPA are necessary to ensure expeditious implementation of the newly reauthorized Clean Water Act.

If this Subcommittee is convinced that additional funding for such implementation is not available and existing funding sources must be utilized, we encourage the clarification that such a set-aside from these basic programs is a one time occurrence only and is in no way a precedent for future set-asides.

The States appreciate your recognition, as a part of the Subcommittee FY 87 Supplemental, that States, as well as the US EPA, will experience escalated implementation demands. ASIWPCA extends its appreciation to this Subcommittee for providing a portion of the proposed set-asides to the States. As documented by the ASIWPCA in its several reports and surveys, States have achieved significant accomplishments using Section 106 funds:

- Since 1972, water quality has improved in 47,000 stream miles and 390,000 lake acres. Designated uses are supported in 488,000 stream miles and 13.8 million lake acres.
- Nonpoint source water quality impacts have been assessed for 165,000 river miles and 8.1 million lake acres. Over 350 nonpoint source programs are operating in the States to address these problems.
- Over 30 State grant and 20 State loan programs now finance municipal wastewater treatment. They will be vital in assisting publicly owned treatment works covered by the National Municipal Policy.
- 74% of facilities covered by the National Municipal Policy have enforceable schedules completed or under negotiation in the States.
- 46 States have or are developing comprehensive groundwater management strategies.

As States turn their attention to emerging areas such as toxics controls, groundwater protection, sludge management, stormwater regulation, and State Revolving Loan Funds, they will need more flexibility in allocating Federal funds to priority problems.

If additional funding can be made available for State environmental management activities, ASIWPCA would suggest that such funds be prorated among the environmental media programs.

Nonpoint Sources

The Association has been supportive of the new nonpoint source program as authorized in the Clean Water Act and urges the Subcommittee to recognize that:

- It is the position of the Association that a modest Federal financial commitment to nonpoint source control is needed to assist States with implementation of ongoing nonpoint source programs. However, if funds are not available to initiate a new program, full appropriation of Section 106 at the authorized level would assist States ready to proceed to initiate programs.
- The Federal government should provide technical assistance and assure that programs are consistent with goals and objectives of the Clean Water Act.

Advanced Waste Treatment Reviews

The requirement in previous appropriation bills that US EPA perform advanced treatment reviews is onerous, burdensome, and unnecessarily time consuming.

While the requirement was imposed to ensure that the use of Federal funds was optimized, the States are of the opinion that the concerns, as originally articulated by this Subcommittee, have been corrected. Advanced waste treatment requirements are being judiciously applied.

With the passage of the Water Quality Act of 1987, the Congress has set forth its intent to delegate more and more responsibility to the States. Along with delegation must come the authority to establish ongoing funding programs consistent with State as well as Federal goals. With the initiation of State Revolving Loan Funds, States need to make their own decisions regarding the optimal use of available funds.

Recommendation: ASIWPCA recommends that the advanced treatment review requirements be deleted.

Timely Release of Funds

The States extend to the Congress their appreciation for timely appropriations relative to State clean water activities. There are, however, problems with Federal funding obligations which we would ask the Subcommittee to address. Specifically:

Section 106 Grants — Section 106 grants are frequently awarded to States late in the fiscal year. The State management assistance grants in FY 86 ($65 Million) were awarded:

.. 17% — the first quarter,
.. 50% — the second quarter,
.. 15% — the third quarter, and
.. 17% — the fourth quarter.

With funding negotiations beginning in early Spring each year, there is ample time to assure prompt grant awards. The US EPA practice of withholding grant funds to negotiate minor or peripheral issues is unjustified — particularly when States must implement the full work program in the interim. This approach causes significant administrative and fiscal management problems. This is particularly true in States where the Legislature or General Assembly meets biennially or for a limited period each year. US EPA's proposal to prohibit carry over of Section 106 funds into the next fiscal year would further exacerbate State management difficulties.

Recommendation: ASIWPCA urges that US EPA be required to issue State grant awards during the first quarter of the fiscal year. States should also be provided the opportunity to continue the existing practice of using carry over Section 106 funds, consistent with their workplan commitments.

State Revolving Loan Funds — Ready access to Federal capitalization grants is necessary to establish and maintain viable State Revolving Loan Funds. The 1987 Amendments recognized this and required US EPA to award appropriated funds to States no later than 2 years after obligation and 3 years after allotment.

Recommendation: ASIWPCA urges the Subcommittee to be vigilant in assuring that States receive capitalization grants as needed, rather than at the end of the allotment period.

Summary

Mr. Chairman, the ASIWPCA extends its appreciation for your willingness to consider the perspectives of the State managers of this nation's Water Quality Program.

STATEMENT OF DR. RUTH PATRICK, ACADEMY OF NATURAL SCIENCES

I am Ruth Patrick, Chair of a consortium of academic institutions in the Middle Atlantic States which consists of Johns Hopkins University, Princeton University, the University of Pennsylvania, Drexel University, the Academy of Natural Sciences, Lehigh University, and the University of Delaware.

It is most important that funds be appropriated immediately to EPA to fund academic consortia if the billions of dollars, being appropriated by government and the private sector on Superfund waste cleanups, are to be spent most effectively.

It is therefore vital that the Congress appropriate through EPA adequate basic and applied research and training grant funds associated with the SARA Superfund program to insure that our best scientific knowledge is being made available, and that invaluable training opportunities are utilized.

This is because we need to apply innovative engineering procedures which are being developed and precise models for mitigation of overall environmental impacts that are based on actual field data.

Furthermore we need to train at once, through short courses for related-skill people, and through undergraduate and graduate training, professionals for implementing technical, engineering and decision and policy-making positions.

No one institution has the quality of expertise to do the basic and applied research as well as to train professionals; nor can such professionals be assembled as quickly as can be done by a consortium.

The formation of a consortium in the middle Atlantic States assembles the expertise in the region where the most severe problem of hazardous materials exist.

The Problem of Subsurface Contamination

One of the most pervasive problems in the United States is hazardous materials and their effect on human health and the environment. They are present in every state in the country: in the air, the water (both surface and ground water), and in or on the land. The sources of hazardous materials are very diverse, and lack present unique as well as general characteristics.

Water, both surface and groundwater, is being degraded by hazardous materials which adversely effect human health and the environment.

Water of high quality is limited. The degree of limitation varies from state to state and region to region. Ground water, which is our largest source of high quality fresh water, is the most difficult source to protect. This is because it is out of site and difficult to evaluate as to quality and quantity. It moves very slowly and it may be many years after contamination occurs before the degradation is identified. Once contamination occurs by complex or recalcitrant chemicals, it is difficult and costly to clean up.

The problems associated with hazardous materials are of many types; technological problems dealing with the characteristic of the hazardous materials; problems as to chemical, geological and physical characteristic of the aquifer; methods of modeling dispersal of the plume of the contaminant and how to monitor its movement; problems dealing with in situ clean up and/or removal of the contaminated water for clean up and possible reinjection.

There are decision problems based on options for methods of clean up, for degree of clean up, for cost of clean up, for extent of liability of owners of wastes and/or owners of sites. Options for control of sources by voluntary cooperation or by laws and regulations must be determined. Options for the management of waste sites, leaking underground storage tanks, spills, etc. must be considered.

One of the most important considerations of the hazardous waste problem is education in the broadest sense.

A. This is funding innovation and/or effective ways of communicating to the public in a believable and understandable way so that they will support the decision makers in the selected solutions. For example, the public must understand;

   1. The severity of the problem, e.g. acute or long term.

   2. Options for mitigating the problem.

   3. Options for dealing with cost versus degree of clean up.

   4. Health effects - acute and long term and risk involved.

   5. How clean up will occur - Problems associated with clean up.

B. Informing and educating decision makers in local, state, and federal government, in agencies, in industry, and in planning and environmentally concerned groups.

C. Education at the undergraduate and graduate level is very necessary because at present there are very few professionals trained in cross-discipline courses which are necessary to have the capability to manage hazardous waste materials in the most effective manner. New methods and procedures must be developed in the technology, engineering, and decision making processes. It is estimated that at the present rate of training, there will be only a few hundred well-trained professionals to handle many thousands of positions which are already in demand and will increase in the latter part of this century.

Solution to These Problems

No single institution will be able to solve the problems set forth above. For this reason, consortia of recognized institutions must be formed. For example, such a consortium has been assembled in the middle Atlantic States by the Academy of Natural Sciences; Drexel University, Johns Hopkins University; Lehigh University, Princeton University, The University of Delaware and the University of Pennsylvania - Wharton School.

Research, applied methodology and engineering, and education will be the three prongs of the program which is as follows.

Mid-Atlantic Consortium
Investigation and Analysis of Subsurface Contamination

INTRODUCTION

The mission or goals of the Consortium is to develop through research and education strategies, management plans and policies for the investigation and analysis of subsurface contamination problems.

The Consortium consists of the Academy of Natural Sciences of Philadelphia, University of Delaware, Drexel University, Johns Hopkins University, Lehigh University, University of Pennsylvania and princeton University. All of these institutions have researchers who have been working in fields pertinent to the mission of the consortium. They realized that as a Consortium they could better interrelate with the resources of sister institutions and thereby elucidate more complex problems.

Presented below is an outline of the first program we want to carry out, "Strategies for Hazardous Material Management." This outline also indicates the fields of interest of the various institutions. This is followed by short descriptions of the types of research needed and the people interested in being part of this program. The proposed educational program follows. This we consider a very importnt part of the program. An appendix includes the curricula vitae of the various researchers interested in the program, and related research which they have done.

A. Research Program
Investigation And Analysis Of Subsurface Contamination

I. Outline Of Program And Institutional Interests
    A. Identification
        1. Site Characteristics
            a. Geological Characteristics
                University of Delaware
                Johns Hopkins University
                Lehigh University
                Princeton University

- b. Biological Characteristics
  - Academy of Natural Sciences
  - Johns Hopkins University
  - Princeton University
- c. Chemical Characteristics
  - Academy of Natural Sciences
  - Johns Hopkins University
  - Lehigh University
  - Princeton University
- d. Climate / Meterological Characteristics
  - University of Delaware

2. Site History e.g. What has been put into the site?
   How has it been managed?
   - Drexel University

3. Design of Site
   Lined - Covering, etc.
   - Drexel University

B. Evaluation and Prioritization

1. Behavior Forecasting
   - a. Physical, chemical, biological characteristics on-site and off-site.
     - Drexel University
     - Johns Hopkins University
     - Princeton University
   - b. Material Transformation
     - Academy of Natural Sciences
     - Drexel University
     - Johns Hopkins University
     - Lehigh University
     - Princeton University
   - c. Toxicology
     - Academy of Natural Sciences
     - Johns Hopkins University
   - d. Ground Water Contamination
     - Academy of Natural Sciences
     - University of Delaware
     - Johns Hopkins University
     - Lehigh University
     - Princeton University

   - e. Material Transport
     - Academy of Natural Sciences
     - University of Delaware
     - Johns Hopkins University
     - Lehigh University
     - Princeton University
   - f. Air Pollution
     - Princeton University
     - Johns Hopkins University

2. Experimental Determination of Site Parameters
   - a. Laboratory
     - Academy of Natural Sciences
     - Drexel University
     - Lehigh University
     - Princeton University
   - b. Field
     - Academy of Natural Sciences
     - Drexel University
     - Lehigh University

3. Policy Evaluation and Options
a. Risk Analyses
Wharton School - University of Pa.
Princeton University
Johns Hopkins University
b. Socio-economic Evaluation
Johns Hopkins University
Princeton University
Wharton School - University of Pa.

C. Remediation
1. Aquifer Rehabilitation
a. Design
Academy of Natural Sciences
Lehigh University
Princeton University
Johns Hopkins University

b. Implementation
Lehigh University
Princeton University
Johns Hopkins University

2. Source Control and Site Rehabilitation
a. Design
University of Delaware
Lehigh University
Princeton University
Drexel University
b. Implementation
University of Delaware
Lehigh University
Princeton University
Drexel University

D. Monitoring / Control for:
1. Validation of Remedial Action
a. Design
Johns Hopkins University
Princeton University
Drexel University
b. Implementation
Johns Hopkins University
Princeton University

2. Environmental and Health Effects
a. Design
Johns Hopkins University - Health
Academy of Natural Sciences - Environmental
Johns Hopkins University - Environmental
b. Implementation
Johns Hopkins University
Academy of Natural Sciences

3. Validation and Verification of Models
a. Design
Johns Hopkins University
Princeton University
b. Implementation
Johns Hopkins University
Princeton University

B. Education Programs

It is well recognized that people trained to do research and to implement the findings in solving problems related to management, policies, and strategies concerned with hazardous materials are relatively few compared with the number of positions open now and in the future. The necessary education and communications programs to train people to manage and be technically trained to correctly prioritize hazardous materials problems now and in the future will require:

1. Graduate and undergraduate training.
2. Short courses to update managers and practitioners.
3. Workshops and seminars to educate the political leaders and the citizenry.

Graduate and undergraduate training will be at individual institutions and integrated courses using faculty from several institutions might be given at one or more central locations. Courses might also be offered where students would spend part of their course at various institutions. Short courses, workshops, and seminars would be given where the demand for such course exists.

Other options under consideration include:

1. Seminars between institutions
2. Visiting scholars and post-doctoral programs
3. Visiting graduate students programs
4. Development of teaching protocol and equipment (e.g., software)
5. Technology-specific seminars and teaching
6. Practical/theoretical interchange
7. Field methods teaching

STATEMENT OF THE IZAAK WALTON LEAGUE OF AMERICA

Statement of the Izaak Walton League of America
on the Fiscal Year 1988 Appropriations
for HUD and Independent Agencies

The Izaak Walton League of America is a non-profit national membership organization dedicated to the conservation and wise use of our nation's natural resources. For more than sixty-five years since the organization's founding in 1922, the restoration and protection of America's water quality has been and continues to be a top priority.

In early February, the Congress overwhelmingly overrode the President's second veto of the Water Quality Act. By enacting the Water Quality Act, the 100th Congress demonstrated to the American people its commitment to the restoration and preservation of the quality of America's waters, the nation's most important natural resource. To fulfill that commitment and to insure that the vital new programs included in the legislation fulfill their potential it is essential that they be funded at their authorized levels in 1988.

For the FY 88 appropriation for the Environmental Protection Agency we recommend the following levels of funding for both EPA's ongoing water quality programs and the new programs and responsibilities enacted by the Water Quality Act of 1987.

The Construction Grants Program

We support full funding for the municipal sewage treatment construction grant in FY 88. Full funding is critical to enabling many municipalities to meet the July 1, 1988 municipal compliance deadline. In addition full funding is essential to enable the States to carry out two of the WQA's most important and ambitious new programs, the nonpoint source pollution program (Sec. 316) and the National Estuaries Program (Sec. 317). Both of these programs contain provisions that allow states to use set-asides of their construction grants money to fund their development.

Nonpoint Source Pollution Control

Nonpoint Source Pollution or runoff from urban and rural lands is estimated to be the source of over 50 percent of the pollutants found in our nation's surface waters today. These pollutants are estimated to cause approximately $6.2 billion dollars worth of damage annually. Section 316 of the WQA added section 319 to the Clean Water Act establishing the first nationwide program to control this as yet a largely unaddressed source of pollution.

The program is a partnership between the states and EPA, requiring states to inventory waters affected by nonpoint pollution and develop and implement plans to control sources of pollution over the next four years. For its part in this partnership EPA provides guidance, technical assistance and funding, on a cost share basis, for the implementation of the state programs. However, there are the two provisions in the WQA for funding the development of state programs. The first authorized EPA to reserve 1% of the funds provided to the states under Sec. 205(j) of the CWA (construction grants authorization) or $100,000 whichever is greater for the purpose of carrying out Section 319. The states may also use 20% of the funds authorized for their use under Sec. 201 (g) of the CWA (construction grants allotment). These funding mechanisms were enacted to ensure that the states would have funds available for the development of their nonpoint programs. Therefore it is critical to the initial development of this vital program that the sewer construction grants program be fully funded at $2.9 billion in the FY 88 Appropriations.

In addition it is essential that the nonpoint program receive its own full funding of $70 million in FY 88, if grant monies are available to the states once they have developed their programs and if the federal government is to uphold its part of the partnership.

National Estuaries Program

Some of this nations most important bodies of water are its major estuaries. The WQA recognized the importance to our nation of these estuaries by enacting section 320, the National Estuaries Program. Like the nonpoint pollution program the estuaries program must receive some of its funding from construction grants monies (CWA Section 205(l), created by WQA Section 210). In addition Congress authorized the expenditure of $12 million annually for five years beginning in FY 87. The viability of many of our nation's most important estuaries as functioning ecosystems is now in jeopardy due to pollution, even fifteen years after the original enactment of the CWA. It is essential that this program receive full support in the appropriations process. Therefore we urge the committee to appropriate $12 million for FY 88 for this program.

Clean Lakes Program

In the WQA Section 101(g) authorized $30 million per year over five years to implement the Clean Lakes program. In addition, WQA Section 315 also authorized $40 million over five years to be used for a lake water quality demonstration program, with another $15 million authorized over five years to mitigate the effects of acid rain. The condition of America's lakes is of critical importance, 50 percent of the nation's water supply comes from lakes and they are an important source of outdoor recreation.

The administration has consistently sought to zero out this program. We recommend that the committee fully fund the program in FY 88.

The State Operating Grants Program

We recommend full funding of this critically needed program at a level of $75 million for FY 88. This program supports much of the work of the states in implementing the Clean Water Act's basic programs. And as a great deal if not most of the responsibility for the implementation of the Act rests on the 38 delegated states (37 states and the territory of the Virgin Islands) it is essential for the realization of the goals and objectives of the Act that these grants be fully funded. Full funding has been made even more important with the passage of the WQA which imposes important new responsibilities on the states.

In addition to the programs listed above the Office of Water programs will need greater funding in the future if the new responsibilities imposed on the agency by WQA are to be met.

The Effluent Standards and Guidelines Programs

EPA is faced with a large amount of unfinished business in these programs because of newly identified industrial catagories and the new responsibilities added by the WQA. To meet this demand it is essential that these programs receive substantial increases in the FY 88 appropriations. We recommend an additional $270,000 in FY 88 for the purpose of achieving a ten percent increase in the level of staffing by the end of the fiscal year so that the agency will be better able to meet these demands.

Water Quality Criteria and Sludge Regulation Programs

We recommend that these programs receive an increase of $300,000 to achieve a 15% percent increase in staffing in order to better enable them to fulfill previous responsibilities as well as new ones imposed by the 1987 WQA.

The development of water quality criteria, specifying acceptable levels of toxics and other contaminants, is one of the most essential elements of the Clean Water Act regulatory scheme. It is the water quality criteria that form the basis for the development of water quality standards which determine the effectiveness of water quality based permits.

In its budget request for this historically underfunded program EPA has proposed the use of "water quality advisories" in the place of the required water quality criteria. The advisories would be based on inadequate information regarding the effects of contaminants on aquatic life and will not meet the requirements of the act.

In addition EPA is almost a decade behind in the development of standards for sewage sludge and the WQA set new deadlines, which occur in mid 1987. And the "toxic hot spot" program authorized by the WQA places additional responsibilities on these programs.

The Water Quality Permit Program

Given the existing backlog of expired permits and the added responsibilities as a result of the enactment of the WQA we recommend a substantial increase in funding for this program.

Currently the agency faces a backlog 18% of the major and 48% of the minor permits, for which the agency is responsible, that have expired and need to be renewed. In addition, the agency must assist the NPDES delegated states as they issue "third round" water quality based permits and develop the first set of regulations for the new storm water permit program created by WQA.

We recommend an increase in funding of $1.8 million to allow the agency to increase its staff by 15% for this program in FY 88.

Water Quality and Analysis and Enforcement

With the need to issue the complex "third round" NPDES permits there is an increased need for EPA to provide analytical and technical assistance to the delegated states and regions. Yet in the face of this need the agency has proposed to reduce funding significantly for the Water Quality Analysis and Monitoring Program. We recommend funding sufficient to increase staffing in this program by 15% over FY 87 levels in FY 88.

Also, at the same time the WQA has introduced a new enforcement program, allowing the use of administrative penalties the agency has proposed to reduce staffing for its Water Quality Enforcement Program. We recommend that funding for enforcement be increased over the FY 87 levels to assure adequate staffing for the new program.

Research and Investigations Budget

Water quality research and investigations develop the scientific basis for much of EPA's water quality programs. We need to know the existence of and the effects of a given toxic substance on aquatic life before we can adequately regulate its presence in effluent discharges. If there is no research today on the harmful effects of pollutants there will likely be no decision to regulate them in the future. By cutting the research budget EPA is reducing the need to fuel regulatory budgets in the future and allowing unknown dangers to our waters to go unaddressed.

In its report to the Budget Committee the Senate Environment and Public Works Committee stated, "Administration request for FY 88 represents a 24% reduction compared to actual spending in FY 81 and is a 6% reduction compared to the FY 87 appropriated level. This reflects serious problems in EPA's planning and management of research programs generally and long term, exploratory efforts particularly."

We recommend that at a minimum the Committee fund the research and development budgets at their FY 86 levels.

In addition to the programs above, there are two programs of special geographic interest to the Izaak Walton League. The first is the Chesapeake Bay program and the second is the Great Lakes Program.

Chesapeake Bay:

If estuaries can be said to be of special significance among our nation's waters then the Chesapeake Bay can be said to be of special significance among the nation's estuaries. This is the nation's largest and historically the most productive estuary in the nation. It has been singled out for special effort by both the Administration and by the Congress. The EPA has had an ongoing program to support and coordinate local and state efforts to restore the Bay. The WQA formally established the program as part of the CWA. We ask that the committee fully fund the Chesapeake Bay program in FY 88 by providing $13 million so that this program can continue to help the States make strides to improve the quality of the nation's largest and most important estuary.

Great Lakes Program:

Of equal importance to the members of the Izaak Walton League is the restoration and maintenance of the Great Lakes' water quality. The Great Lakes program authorized by Section 104 of WQA, if fully funded will greatly enhance our ability to achieve that goal. The program authorizes the previously established the Great Lakes National Program Office. The office will develop and carry out action plans in fulfillment of the United State's responsibilities under the Great Lake Water Quality Agreement of 1978. The office will also, in conjunction with the States, establishing programs to address the problems of nutrients and toxics in the Great Lakes. In addition the Great Lakes Research Office was established in the National Oceanic and Atmospheric Administration to both, identify needs for and coordinate and conduct research. In order for this program to fulfill its potential in restoring the water quality of the Great Lakes we urge it be fully funded in FY 88.

We ask the Appropriations Committee to fulfill the commitment to the restoration of America's water quality that Congress demonstrated with its overwhelming override of the President's veto on the Water Quality Act earlier this year and ask the Committee adopt the funding recommendations that we put forth above. Such spending is not "budget busting" but an investment in future viability of this nation's most precious natural resource, its water.

We thank you for your continuing support for Clean Water Act and its goals.

SUBCOMMITTEE RECESS

Senator PROXMIRE. The subcommittee will stand in recess until 2 p.m. this afternoon in this room, and we will continue to take testimony from congressional and public witnesses. Senator Lautenberg will chair the hearing, as my schedule will not permit me to do so.

[Whereupon, at 12:42 p.m., the hearing was recessed, to be reconvened at 2 p.m. the same day,]

(AFTERNOON SESSION, 2:12 P.M., FRIDAY, MAY 8, 1987)

NONDEPARTMENTAL WITNESSES

INTRODUCTORY REMARKS

Senator LAUTENBERG. This subcommittee will come to order.

The Chairman apologizes for being tardy, especially when we have a distinguished Congressman in front of us. Senator Proxmire regrets that his schedule will not permit him to be here this afternoon. I, too, regret it. [Laughter.]

Within the next few hours we will hear from a number of public witnesses regarding the budgets of the National Science Foundation, the Federal Emergency Management Agency, the National Aeronautics and Space Administration, and the Veterans Administration.

HEARING PROCEDURE

Before we begin I have been asked to go over the procedures that are going to be used. Each witness will have only 4 minutes in which to present his or her testimony, due to the large number. When 1 minute is remaining, the yellow light is going to come on; the red light will come on when your time is up. Keep in mind that your entire statements will be printed in the public hearing record.

Our first witness of this afternoon's session will be the distinguished Representative Martin Sabo from the state of Minnesota, who I have worked with on environmental issues and who will be testifying in regard to the National Science Foundation's Advanced Scientific Computing Program.

Martin, it is good to see you, and please proceed with your testimony.

NATIONAL SCIENCE FOUNDATION

STATEMENT OF HON. MARTIN OLAV SABO, U.S. REPRESENTATIVE FROM MINNESOTA

SUPERCOMPUTER PROGRAM

Congressman SABO. Senator, good to see you, and to see you in a different subcommittee.

Senator LAUTENBERG. Indeed.

Congressman SABO. I appreciate the opportunity to appear, and I would appreciate it if the entire statement could be in the record, and I will briefly review it.

Senator LAUTENBERG. Without objection.

Congressman SABO. I am here to visit about the NSF Supercomputer Program.

In 1981, Minnesota was the first university to create a supercomputer center in this country. It is the only supercomputer center with a Cray II computer, and yet today a University of Minnesota researcher, funded by NSF, cannot use that supercomputer center. To me, it is illogical, unfair, and cries for change. How did we get to this silly position?

As I indicated, Minnesota, along with two other universities—Colorado State and Purdue—started supercomputer centers. NSF contracted with them for supercomputer services. The NSF then moved to compete for the creation of some new national supercomputer centers. That was funded by this Congress. Minnesota was one to compete; they did not win—looking back, I think for some strange reasons.

One of the reasons they didn't win was we were told that the Cray II was too experimental. History hardly proves that correct, but we are not here today to talk about history.

NSF continued to contract with Minnesota, Colorado State, and Purdue as the national centers were established. Last year we included funding for contracting with these three phase I centers.

In the process of passing the appropriation bill there was an overall cut in supercomputing. NSF chose to take a disproportionate share of this out of supercomputing, and in the process cut out all funding for the three phase I centers. Minnesota tried to negotiate with them.

RESEARCHERS DENIED ACCESS

Now, I might indicate that Minnesota was told on February 11, that on February 13 their contract would end—2 days' notice. In that time, Minnesota had 334 NSF principal investigators from 98 universities using their center. They had also had a very favorable site review in September; so, clearly they were doing a good job. Minnesota continued to negotiate with them.

At one point an offer was made. I might indicate that after that February cutoff, Minnesota continued to fund from their own resources the NSF investigators until April 15. They made an offer to NSF that they would match funding in the following manner: $500,000 from the University, $500,000 from Cray, and and $500,000 from NSF, for the balance of the year—a leveraging of 3 to 1 for NSF. NSF turned that down; in my judgment, a wrong decision.

Where do we go from here? In my judgment, the NSF decision is a wrong one. It cuts off resources to the NSF researchers at the point in time that the need for supercomputing is expanding in this country. And I know the particulars in Minnesota better, and Tim Wirth will be here to speak about Colorado State.

SOLUTION OFFERED

What we are suggesting in our written testimony is both a long-term policy for supercomputing and also a short-term. We are suggesting that a certain percentage of funds for supercomputing in 1988—and we suggest 15 percent or 10 percent—be set aside to continue the capacity of the phase I centers to be able to contract with NSF for those researchers who want to use their facilities.

Let me make it clear that we are not asking for money to buy equipment; that has been done at the phase I centers before the NSF program was even started. We are simply saying that we think that fairness dictates that these three centers, which took the initiative to create the centers before NSF had a program, that NSF researchers should still have access to those facilities.

I guess that is the heart of what we are saying. We would just say we think the direction NSF has gone is wrong policy, unfair to these three centers, and does not make good scientific sense in this country.

I might add that NSF will oppose what we are saying; they seem to have dug their heels in very deeply. I don't understand it. I think it is regretable.

Senator LAUTENBERG. Thank you very much, Congressman Sabo.

We are pleased to have with us Senator Wirth from Colorado.

Obviously, you share a view and a concern about what happens with supercomputing. We, too, have an interest in the state of New Jersey, perhaps a place that you are familiar with, Senator. We invite you to give your testimony.

We have no questions for you, Congressman. You are free to listen, or free to go, as you choose.

Congressman SABO. Thank you. I think I will wait and see what the Senator has to say.

Senator LAUTENBERG. If we are sure that he is not looking to cut up the pie in any way that you like, is it okay? I will try to control the presentation.

[The statement follows:]

STATEMENT OF CONGRESSMAN MARTIN OLAV SABO OF MINNESOTA

Mr. Chairman, members of the committee, I appreciate the opportunity to appear before you today.

There is a matter of serious concern with the NSF's Advanced Scientific Computing Program that I'd like to share with you. It involves a local problem that, in my judgement, illustrates a larger problem within the agency.

A year ago, I requested that Congress increase the amount of funds for Phase I supercomputer centers in FY 1987. As you may remember, NSF had requested $35.5 million for Phase II centers in 1987 and only $2.33 million for Phase I centers. The House Appropriations Committee included an additional $1.4 million for Phase I centers in the 1987 HUD bill and I believe the Senate remained silent on the issue.

Unfortunately, in the final continuing resolution NSF received a general cut of five percent. It applied this cut differentially throughout its programs and the Advanced Scientific Computing Account received a cut of about 13 percent. This resulted in a complete elimination of funds for the Phase I program. I believe that this is a fundamental mistake. It is also grossly unjust. In order to explain why I feel this way, I would like to briefly review the history of this program with you.

A. History of the Current NSF Program

In 1984, when the Advanced Scientific Computing initiative was developed, the Foundation was buying time from available supercomputers for its researchers who needed supercomputing time. It did this by contracting with existing centers. Three were in academic situations -- the University of Minnesota, Colorado State University and Purdue University. (There were others in business settings but I will not discuss them here.) These centers were called Phase I Resource centers.

In its initiative the Foundation proposed to develop a limited number of national supercomputer centers which would be designated as sites for use by NSF researchers and grantees. These sites were to be selected through a national competition. This competition was held and three academic sites were selected. Two were added later and these institutions -- Princeton, San Diego, Illinois, Cornell and Pittsburgh -- now comprise the Phase II centers for national advanced scientific computing.

In 1984 when the House Science and Technology Committee reviewed this initiative its report cited a study that said there was an immediate need for two large-scale machines by science and engineering researchers. This report (the Borden/Curtis Report) further stated that as many as ten of these machines would be needed by researchers in the near future and that "at present many U.S. researchers are obliged to carry out their advanced scientific computations at foreign facilities."

Dr. Knapp, the Director of the NSF in 1984, reported to the House HUD subcommittee that:

> There was virtually unanimous agreement that important science is not being done because academic scientists and engineers have limited access to computational resources . . . the needs for access to supercomputers in a variety of disciplines are not well specified or understood. Yet it is likely that they will never be identified fully until scientists have much better access than at present.

We have since learned how farsighted his remarks were.

For the last three years NSF has funded the Phase I resource centers at a modest level as it has worked to build up its Phase II national centers program. In that same time we have seen a virtual explosion in the understanding of supercomputing possibilities. Scientists all over the country are just beginning to realize the incredible work they can do with this technology.

In 1986 NSF decided that it could no longer afford its Phase I centers even though the Phase II centers were not completed. It has summarily denied access to

Phase I centers for its researchers. In fact the University of Minnesota was told on Wednesday February 11, 1987, that it had to close down all its NSF accounts by Friday, February 13, 1987. Up until that point the University of Minnesota staff thought they were negotiating with NSF. I don't know all the details of their discussions but two days notice hardly seems fair -- to either the center or its NSF users.

The University of Minnesota has 334 principal NSF investigators from 98 universities using their center. All of these people will be displaced by current NSF policy. In fact, the University of Minnesota continued to support NSF researchers after the February 13 cut-off by providing free time through April 15 while they tried to negotiate with NSF. They offered NSF a three for one leveraging of computing time for the remainder of 1987. This proposal contained a $500,000 commitment from the University of Minnesota and $500,000 from Cray Research if NSF would pay the remaining $500,000 its grantees require to complete their 1987 work. NSF rejected this offer -- hardly a wise use of taxpayers' dollars.

The University of Minnesota is also unique because it is the only NSF center that has a Cray 2 supercomputer. I have heard from a number of scientists who need the Cray 2 for their research and I would like to share with you comments made by two of them. A mathematics professor wrote me:

> "I wish to add one point . . . . Of all the Phase I and Phase II Supercomputer Centers, the Minnesota Supercomputer Center is the only one which has a Cray 2 computer. While this machine is only slightly faster than the Cray XMP and the Control Data 205, which are the machines at other centers, it has a significantly larger internal memory. This means that there is a large class of problems which cannot be done on the other machines in a reasonable amount of time. In other words the National Science Foundation has not just cut off one of a number of centers, it has removed the only state-of-the-art machine from the basic science community."

An astronomer wrote:

> "I was very pleased to hear of your recent interest in the University of Minnesota Supercomputer Institute and its problems with NSF support. I think it is a shame that scientists cannot get support to use whichever supercomputer center best suits their requirements no matter where it is located. . .
>
> The Cray II at the Minnesota Supercomputer Institute is the only machine with a large enough memory for our project. We have the potential to connect the world's fastest astronomical measuring machine with the world's largest computer.
>
> Unofficially, I have been told that NSF was very impressed with our request for supercomputer funds for use of the Minnesota Cray II, because our project is rather unique in that it will produce concrete results and because we cannot effectively use any other machine. But yet I have recently heard that there are no more funds available for use of the Minnesota machine. It is very ironic that the Astronomy Division at NSF has funded our project for the next two years . . . but another division at NSF is prevented from giving us the money to use the Cray II!"

Today we find ourselves in the situation where the federal government is cutting back access for its researchers to supercomputing facilities just at the time interest and demand are escalating. While the national center model for providing this service made sense in 1984, it may no longer be appropriate in 1987. Today there are 14 or 15 universities in the country which have supercomputers. NSF has funded supercomputers for only 5 academic centers, so there is obviously much more interest in this technology than we anticipated. (The three Phase I centers have had NSF support for users but they also acquired their supercomputers before NSF was involved.) Clearly these other institutions have entered this field with serious support from their state governments and other local sources. This indicates to me that there is a much greater commitment to the use of this technology in academia than we in Congress had anticipated.

I believe it would be truly unfortunate for NSF researchers if they are limited to only one-third of the available resources for time and support in this work. I also believe it is unfair and poor public policy to cut off all funding for Phase I centers which were started with local initiative and local funds. At the same time, I realize we have limited federal funds and we need to support the program we started at least until it can stand on its own. For these reasons I would like to propose to you a new approach for the federal support of advanced scientific computing programs.

B. Proposal For A New Supercomputer Program Over the Long Term

In order to honor our commitment to Phase II centers, I would propose that we continue that program as it has been started by NSF through the duration of their present contracts (I believe most of them have five year contracts with NSF which will expire in 1990 or 1991). At the same time I would propose that a certain portion of the funds -- perhaps 15 percent of the total -- continue to be available for NSF researchers to use Phase I centers. Under this proposal NSF grantees will have access to eight different academic centers with their varying equipment and technical support staffs.

After the Phase II contracts have expired, I believe NSF researchers should be able to purchase time at any facility which they consider appropriate to their needs. Obviously, there would be some limitations. Each institution would have to negotiate an acceptable fee schedule with NSF if it wanted to be approved. Also NSF would have to monitor the proposals of its researchers so that the use is appropriate.

I believe that this type of system will provide the maximum opportunity for our federally-funded scientists to get the best computing support available. At the same time, it will reward institutions which have serious local support and provide the most innovative and comprehensive services to their users.

C. Request for 1988

The House-passed budget contained a 13 percent increase for NSF for 1988. I understand that the Senate version of the budget is even more generous than the House bill. While our final budget may not provide as much as the Administration requested, it will still be substantially higher than last year and should give the committee some flexibility.

I urge you to include a provision for funding Phase I Supercomputer Centers in the Advanced Scientific Computing Account. I recognize that the federal government has an obligation to support the Phase II centers and I do not want us to take any money away from them. However, I feel the Phase I centers have been very badly treated by NSF and I urge you to remedy this injustice.

These centers were created through local initiatives with local funds. They provided needed support to NSF researchers when they had nowhere else to go.

We are not asking for federal funds for hardware. We are not asking to be designated Phase II centers. That time is over. We are merely asking for the opportunity to continue to serve NSF researchers. To be deprived of a major portion of the academic client base, when we were the first American institutions to support them, is grossly unfair.

I urge you to include some funds for Phase I centers so that NSF researchers who want to work at these centers can continue to do so.

STATEMENT OF HON. TIMOTHY WIRTH, U.S. SENATOR FROM COLORADO

SUPERCOMPUTER CENTERS

Senator LAUTENBERG. Senator Wirth, welcome.

Senator WIRTH. Senator Lautenberg, thank you very much.

First of all, I would like to associate myself with the comments made by Congressman Sabo. I agree with his comments, with his perception about the three centers in question and the phase I centers. I am familiar as well with the institution in Princeton, NJ, which has a broad network—as a phase II center—a broad network of other institutions around the country. I appreciate your careful stewardship of that phase II center, and I also appreciate your generosity in hearing the case for the phase I centers as presented by Congressman Sabo and myself.

I would just add to the comments that Marty made two issues: One, to emphasize a little bit more the risk that was taken by Minnesota, Purdue, and Colorado State in putting the resources into the initial supercomputing centers. This was an extraordinary commitment at a time of real challenge within the state of Colorado, and I think this has been true with Purdue and Minnesota as well, that these institutions reached back and really made a major commitment on their own.

But then, when the NSF in the early 1980's decided to go to supercomputer centers, we were very supportive of that. I think all three institutions were. And I think all were bitterly disappointed at the fact that this initial investment had been made but was not recognized by NSF. I think we were deeply concerned about that, a little bit bewildered, more than disappointed, in fact, a feeling that the kind of entrepreneurial spirit that those institutions had earlier shown was not being rewarded as it should have been.

During the 1984 and 1985 years, I had inserted in the NSF authorization language through the subcommittee on which I sat, chaired by Doug Walgren of Pennsylvania, a language that urged—and with which I believe NSF agreed—that they would examine the phase I centers and help to support them. That has not come about.

CUTBACK UNEVENLY DISTRIBUTED

When the cutback came in funding last year—the 5 percent across-the-board cutback for NSF—NSF distributed that cutback not evenly across the board but very unevenly. The result of that was a sudden, sharp and very, very difficult drop in funding for the institution that I represent, and I believe the same happened for Minnesota and Purdue. We lost a disproportionate amount of funding. We are now in a very significant scramble.

As Marty pointed out, we are not asking for resources for new equipment; that investment has been made. What we would like is the help of NSF for the continuing operations of those centers. We would also like to have NSF's support in helping our center—and I would bet that this is true for Minnesota and Purdue as well—to reach out to other customers, and to help us through a very difficult transition time.

We recognize the fiscal constraints under which we are operating, but I think it is fair for us to ask that the investments early-on made—very significant institutional investments—they took a chance, they took a risk—that those should be recognized as well.

I think there is very clear congressional intent on this, coming out of the report language that was voted in 1984–85, and I think that we ought to have NSF help us through this transition time.

So I thank you very much, Mr. Chairman. I have a statement which I would like to include in full in the record.

Senator LAUTENBERG. Without objection, your statement will be included in the record.

I thank you for your comments. We hope that the subcommittee will make the right kinds of decisions on your behalf.

Senator WIRTH. We look forward to having our centers work closely with the center in Princeton, Mr. Chairman.

Senator LAUTENBERG. I look forward to that, too. As we enlarge the Princeton center we are going to need ancillary contact around the country. [Laughter.]

Thanks very much.

Senator WIRTH. Thank you very much, Mr. Chairman.

[The statement follows:]

STATEMENT OF SENATOR TIMOTHY E. WIRTH

Mr. Chairman, members of the subcommittee, thank you for this opportunity to testify today. I am pleased to appear before you to discuss the appropriations for FY 1988 and, in particular, a matter of vital importance to the nation, the National Science Foundation (NSF) supercomputing program.

Since 1981, Colorado State University in Fort Collins, Colorado has operated a supercomputing center for its own sophisticated research needs and for those of a wide array of remote users. In 1984, the NSF Advanced Scientific Computing Initiative selected Colorado State, the University of Minnesota and Purdue University to provide supercomputing resource access to NSF and other academic researchers.

Funding for these three Phase I centers has gradually decreased in recent years. In FY 1985 and FY 1986 funding was approximately $10.2 million. Last year the NSF requested $2.3 million -- a precipitous decline of almost $8 million in two years.

In response to this situation, I contacted the House Appropriations Committee and urged my colleagues to make more funds available for the Phase I supercomputing centers. I was pleased when an additional $1.4 million was included for Phase I supercomputing centers.

Unfortunately, the conference report with the Senate was less generous and NSF received a five percent across-the-board cut in appropriations. It applied this reduction disproportionately, reducing the Advanced Scientific Computing Account by 13 percent, and eliminating the Phase I Supercomputing Program altogether.

This was done despite statements submitted by NSF -- at my request -- to the House Subcommittee on Science Research and Technology, of which I was a member. Earlier last year, NSF indicated that the needs of the research community could not be met by the Phase II centers, necessitating further funding for the Phase I centers for FY 1987.

Needless to say, this has created severe difficulties for each of the institutions involved.

My comments today are geared toward restoration of needed funding for the Phase I centers. To this end, I would like to make three points.

First, I would like to remind the subcommittee that the supercomputing program was initially developed at the insistence of Congress in spite of reluctance by the NSF. In 1984, the original Congressionally approved plan for supercomputing called for the development of between eight and ten supercomputing centers of excellence requiring annual funding of near $100 million. Unfortunately, the NSF only proceeded with five centers. In other words, the current program falls far short of that originally envisioned by both the Senate and the House of Representatives.

In spite of NSF concerns to the contrary, each of the current centers is popular and highly utilized. Phase I centers provide a principal source of training, graduate education, advanced computational research, and telecommunications -- all of which are essential to advancing supercomputing research. Restoring needed funding for the academic Phase I centers for the purchase of supercomputing cycles, and to support training, graduate education and research, is necessary to sustain faculty interest and abilities, provide a greater pool of capable operators and researchers, and to broaden and diversify the areas of computationally-based research and application. This will increase industrial interest, expand state investment, encourage upgrading of equipment to maintain state of the art computational hardware, and provide the needed regional access to supercomputing facilities and activities.

In short, restoration of funding for FY 1988 will help secure the original objectives envisioned by Congress when it implemented the national supercomputing program.

Second, the NSF determination to move away from the Phase I centers and toward the exclusive development and use of Phase II centers fails to recognize the significant work and resource investments made by Colorado State University, the University of Minnesota and Purdue University. Each of these institutions took enormous risks and each has continued to maintain substantial investments of their own financial and intellectual resources in order to provide needed supercomputing capabilities for the nation. In addition to installing hardware, Colorado State developed telecommunications training and other support services necessary to make their facilities available to both on- and off-site users. To date, nearly all the concrete examples of how the supercomputer can beneficially affect academic, scientific and engineering research have derived from researchers using the Phase I centers.

One small but illustrative example of Colorado State University's investment is its tireless efforts to develop a networking program to provide greater access to its supercomputing facilities for universities and schools in five western states. The proposal -- WESTNET -- is currently before the NSF for approval. We anticipate a favorable decision shortly which will benefit the academic and research communities across much of the western United States.

In my estimation, it is extremely important that we not turn our backs entirely on the time, talent and resources expended by these universities in an effort to provide national supercomputing capabilities. Failure to restore Phase I center funding in the FY 1988 budget will complete the federal government's abandonment of these institutions and a proven, capable program.

Finally, the current situation allows the NSF to dictate to the national research community how and where scientific research is to be done. This restrictive environment has stymied researchers' ability to make intelligent choices based upon individual research needs, and can only act as an impediment to the performance of quality scientific research.

Abandonment of the Phase I program will foreclose NSF-funded researchers from access to proven resources at Colorado State University, the University of Minnesota, and Purdue University. This limits our ability to satisfy the scientific community's rapidly expanding needs, which in turn limits advances which contribute to our nation's strategic and economic abilities. In this period of fiscal restraint it makes eminent sense to continue to build on the foundation of federal investment already laid at Phase I centers.

It is clear that increasing research freedom and access to resources provides the proper climate to foster and encourage needed advances. Should Congress fail again this year to restore funding to Phase I centers, we will place another roadblock in the way of much-needed supercomputing research. This in turn will have attendant consequences for our currently-acknowledged national leadership in this vital area, particularly at a time when foreign governments have expressed strong interest in developing their own supercomputing capabilities.

Let me conclude by urging the subcommittee to restore its commitment to and support for the national supercomputer program by providing FY 1988 funding for the Phase I centers at Colorado State University, the University of Minnesota, and Purdue University. I invite and encourage each of you to visit the facilities at Colorado State University and see for yourselves the vitally important role they play in our national research capabilities. I look forward to working together on this project in coming months and thank you for your time and attention.

PROCEDURAL INSTRUCTIONS

Senator LAUTENBERG. Dr. BOGORAD, we welcome you.

I wonder if we could save some time and ask, Dr. Crum, if you would mind sitting up here at the same time. We are going to be moving fairly rapidly, and when Dr. Bogorad is finished.

And, Mr. Page and Mr. Britt, would you mind coming up? And Dr. Null? I think we still have enough seats for that purpose; if not, I am told we are allowed a chair or more if we need one.

We will go in the precise order that we have invited you up.

You have all heard the fact that, while we are interested in the specific testimony that you have to present, in the interests of time we ask you to summarize. Your full statements will be recorded in the record, and of course we invite you to turn those in to make sure that will happen.

We ask Dr. Bogorad, if you would, to make one word of introduction, to make sure everybody knows who you represent besides your own good judgment, and to proceed with your abbreviated statement.

STATEMENT OF DR. LAWRENCE BOGORAD, CHAIRMAN, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

NATIONAL SCIENCE FOUNDATION BUDGET

Dr. BOGORAD, Thank you very much for the opportunity.

I must say I am pleased to see these computers growing all over the country, in Princeton and elsewhere. But thank you very much for the opportunity.

I am representing the American Association for the Advancement of Science, of which I am currently the chairman of the board. In real life I am a professor of biology at Harvard University. We are testifying on behalf of the NSF budget.

I guess, really, to go directly to the issue—and we have the statement recorded—let me really completely deviate from that pretty much and go directly to the business of the NSF budget and the question of is it too big or isn't it too big, and what should it be?

I guess there are two questions one could ask: One, why should we spend any money on basic research? And that is a kind of rhetorical question at this time. Second, why should one propose to increase the NSF budget by 17 percent?

Now, underlying both questions, I think, is the fact that an important element in achieving our status as a country in the world has been ingenuity and creativity in America. And now, as our economy and our society has become more and more based on science and technology, it is again very important to maintain the atmosphere of research, productivity, and creativity in our research universities. It is in those universities that 100 percent of the scientists and engineers begin their training. It is a place where a substantial amount of basic research goes on.

So, the health of basic research sumport by the NSF is of broad importance. And while it has been very productive, I think it has to be recognized that it is not only vigorous but is very fragile, and the thing can collapse. So I think the basic necessity for sustaining a high level of effort is fairly clear.

Now, on to the famous 17 percent. First of all, is it really 17 percent? For science as a whole, if you don't just take the NSF budget—although I recognize that is what you have to be particularly concerned about—for science as a whole the administration's budget shows an increase of less than 1 percent across the board for all kinds of science. So it really is a very small amount for the whole element, and that is against an inflation rate of probably 5 or 6 percent.

REDUCTION SERIOUS MATTER

Now, everybody who has a budget, in anything, has to face that 5 or 6 percent; but it can be very serious here. So, the 17 percent for the NSF represents in total a very small increase elsewhere.

As far as the NSF itself is concerned, in general it is about a 10- to 15-percent increase in each category, and here one of the elements is to try to increase the size of each grant. That is an important element because, because of the tax laws already, there are some changes which will instantly introduce a 2- to 4-percent reduction in what money is available, and that has to be met for next year, again. That is because of the way the research assistants, the graduate students, are being taxed under the new bill.

So there are a lot of places that are very, very difficult, a lot of places where this money is really needed in order to make more effective use of the present research establishment.

I see that we are halfway through the 1-minute button.

Senator LAUTENBERG. I hate to do that to you; I know how hard everybody has worked.

Dr. BOGORAD, I understand. Of course.

I have not mentioned the centers. There has been a lot of discussion about that. The grant sizes, besides the issue of their immediate reduction, also deals with the fact that the kinds of research that people are doing has changed; we have moved from more observational research to other things, so we need money for that.

And in the last moment, let me say that we, as I think many other groups, want to emphasize the need for funds for science education, which really underlines our entire establishment.

Senator LAUTENBERG. Thank you, Dr. Bogorad. Again, I feel badly that we don't have the time to hear more from you.

[The statement follows:]

STATEMENT OF DR. LAWRENCE BOGORAD, CHAIRMAN, BOARD OF DIRECTORS, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Mr. Chairman and Members of the Subcommittee:

Thank you for the opportunity to appear before your Subcommittee. First, I would like to express our deep thanks and appreciation for your strong and continuing support of scientific and engineering research for so many years. Your support has been especially important to the science, math and engineering education programs at NSF.

I am appearing today as Board Chairman of the American Association for the Advancement of Science, although I am also the Maria Moors Cabot Professor of Biology at Harvard University.

Today I plan to cover several areas briefly: (1) an overview of the total NSF budget request; (2) supercomputing and science; (3) science, math and engineering education; (4) International Institute for Applied Systems Analysis (IIASA); (5) instrumentation; (6) and individual vis-a-vis center or group research awards.

Summary of Remarks

To summarize our views on the NSF budget request:

o Generally we support the NSF request except in the area of pre-college science and mathematics education. We suggest an increase from the $68 million level to $100 million.

o We applaud the NSF's strategic thinking with respect to supercomputers and networking.

o NSF should set a number of specific goals, either along or in cooperation with the Department of Education, in science, math and engineering education. Examples of such goals can be provided upon request.

o The enormous set of problems associated with inadequate and outmoded equipment and instrumentation has been amply shown. At this time we do not wish to develop this case further but do wish to express our support for the NSF position in stressing continued growth for this area, as shown in Figure 1.

o Considerable attention and concern has been devoted to the issue of an appropriate balance between individual and center (or group) research awards. There is insufficient time for an analysis of this matter but I can summarize our views briefly. We do not see cause for alarm in the current mix in NSF's awards. There is a place in our system for both centers and individuals; each approach has advantages and disadvantages. However, I wish to reaffirm a deep belief in the strength of the American research system which owes so much to the individual investigator. It is the balance over time -- as shown in Figure 2 -- which needs careful monitoring. A special feature of this monitoring must be focused on the average size of individual awards which has been seen increasingly as a problem in many fields.

o We urge continued modest support for the International Institute for Applied Systems Analysis (IIASA).

OVERVIEW COMMENTS ON THE BUDGET

First, we strongly support the overall growth rate reflected in the budget request. And while it may be optimistic to expect the plan for doubling the NSF budget to the $3.2 billion level by Fiscal Year 1992 to come to fruition, we do support this important objective. This objective should be viewed in the context of maintaining and improving the strengt. and health of American science and engineering research as an essential basis for the long-term improvement of the overall U.S. economy.

We do acknowledge the difficult set of priority questions facing you on this Subcommittee and the Congress generally in light of other pressing national needs and the limitations imposed by the Gramm-Rudman-Hollings framework. However, the proposed rate of growth in the NSF budget is a good, if partial, step in the direction of redressing the problems associated with the level plateau of investment in research from the late 1960s to the late 1970s. Further, the overall federal increase in FY 1988 for basic research is less than 1 percent -- and in constant dollars actually declines by 3.5 percent. In this context, the 17 percent increase for NSF is not all that large.

While I do not intend to claim that this national underinvestment in research explains fully the state of our current economic problems, I think a very strong case can be made that future research investments must be a central part of a total program for revitalizing our economy.

To the extent that we differ from the program and budget proposals of the NSF, it is on priorities in a few areas. I hasten to add that the areas of agreement are large and the areas of differences are relatively small. It is in the area of science and mathematics education that we find ourselves in less agreement than in others.

SUPERCOMPUTING AND SCIENCE

Turning now to the subject of supercomputing I would like to stress its importance in two broad ways: (1) as part of wide-area networks and (2) as a major influence in the transformation of research in science and engineering.

There is a strong case for NSF support of supercomputers. We strongly support last year's substantial increases by Congress for NSF's supercomputing program. Supercomputing capabilities will be critical to enhancing and facilitating advances in research -- from fundamental science to industrial and governmental applications, including national security. Thus it is important to look at these capabilities in a national context -- not just through the lens of the NSF.

I believe there is an urgent need for increased federal sponsorship and support for a higher education computer network. More specifically, we must think seriously about establishing supercomputer centers in the context of a national network. In this regard, during the past year the NSF has taken some very positive steps both in supercomputers and in networking.

Increasingly over the past few decades, the pace and complexity of research, especially collaboration involving different institutions and interdisciplinary areas, have substantially increased scientists' communication needs. Scientists and engineers in many, if not most, fields now need immediate access to data and information, to colleagues and collaborators, and to advanced computing and information services.

To be really useful, communication and information facilities must be integrated with the researcher's day-to-day working environment. This combination of computing, communications and information sources is called computer networking. These networks will provide the structure that combines geographically separated researchers, computing resources, and information bases into a single integrated environment.

Regrettably, we are not yet at this advanced state. However, the NSF is focusing attention on the many problems which need to be solved. NSF strategy involves establishing and building a national networking program under the name NSFnet. The concept of NSFnet is not only to build new networks but also to add on to existing networks. While NSFnet has been designed initially for supercomputer users, it also is expected eventually to be a general-purpose computer communications network for the entire academic research community and associated researchers. In short, NSFnet seeks to become a "network of networks."

In concluding this section, I would like to make several summary remarks:

(1) Computers of all kinds, including large supercomputers and mini-supercomputers, are becoming crucial to making new discoveries and are increasingly central to advances in most fields of science and engineering.

(2) There is an immediate need to make supercomputers available to U.S. researchers as widely as possible.

(3) The advanced work station will become an important feature of research performance in the years ahead.

(4) Networks are required to link researchers via their workstations to supercomputers, to data bases and to each other.

(5) The supercomputer programs -- as supported by NSF, Defense, and the Department of Energy -- have acted as a spur and incentive for U.S. industry, comparable to the early support by the federal government's for large computer mainframe progress. I hope the Subcommittee will give its strong support to NSF's efforts aimed at establishing and building a strong supercomputer program and a national networking program. NSFnet is likely to have far-reaching, powerful positive effects on the conduct of science and engineering and advancing computer networking in the U.S.

SCIENCE, MATHEMATICS AND ENGINEERING EDUCATION OVERVIEW

The serious state of affairs in U.S. education and the gravity of the associated problems are already well-known to you. Therefore, it will be unnecessary for me to summarize the many special studies and reports of the past several years on science, math and engineering education. Clearly, education is increasingly seen, along with international business and trade, as a key area of concern in our search for solutions to the problems we associate with our diminished competitiveness. It is time to acknowledge firmly and unequivocally that national policy should be to help establish, nuture and encourage the development of a consistent, integrated program of science and mathematics learning from kindergarten through high school. There must be a commitment to persist in our programs at the federal level long enough for change to occur, especially in the areas of curriculum development, teacher training and the research base in education. Particular emphasis must be placed on the R&D portion of the science education budget.

Perhaps it is no exaggeration then, to suggest, as has the National Journal, that we have a large "education deficit" as well as a "budget deficit." Our "education deficit" is across the board -- in teachers and teacher training, in learning methods, in educational motivation, in school organization, in curriculum content and structure, and in educational research. All of this together presents a grim picture and a worrisome outlook. Before addressing specific education issues in the NSF, I would like to offer several cautionary notes on how to proceed.

(1) The range of problems is so broad and their roots so deep that we may be tempted to throw up our hands and say "let each school district or state worry about its own special problems. It's much too complicated to do so nationally." Yes, the states and the schools have central roles but, as I will argue, the federal government has a vital role to play also.

(2) The gravity of the problems may lead to political pressures for rapid action arising from our national predilection for "short-term" solutions for problems of any kind. We must avoid crash responses. Far more valuable would be a policy of sustained and substantial commitment by the federal government in a catalytic role. The focus over the next 10 to 20 years could be specific improvements along a broad front in cooperation with the states and localities.

(3) I am concerned that the growing linkage between our international competitiveness and education might become the only reason for supporting a broad, national effort in education. Our efforts to improve our educational system should be more broadly based than on this one dimension. The connection is important, and it is reasonable to argue for increased educational support on such grounds, we must not lose sight of other objectives such as those related to the quality of life.

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(4) Finally, we must be attentive to the integrated nature of the requirements facing us: scientific literacy for our citizens, the training of an effective workforce for an increasingly technological economy, and the education of professional scientists and engineers for industrial work, teaching and research.

Education Budget Overview of NSF and the Department of Education

A review of the total budget numbers for NSF and the Department of Education reveals that:

o On what seems to a definite overall positive note, the NSF shows a proposed increase for a newly defined informal grouping of programs called "education and development of human resources." Its budget numbers show an increase of $91 million from $182 million in FY 1987 to $273 million in FY 1988.

o On the strongly negative side -- at least from a budgetary point of view -- is what seems to be a virtually total withdrawal of the Education Department from science and mathematics education. However, almost worse than the withdrawal has been the policy instability in implementing the Education for Economic Security Act (EESA) of 1984. It is difficult to understand what anybody hopes to achieve in a program that shoots up to $100 million in FY 1986 and then to zero in FY 1988. Moreover, congressional insistence on a formula approach to grants led to partitioning the total funding into what often became ineffective small awards of a few hundred dollars.

The NSF Five-Year Strategic Plan for Science, Math and Engineering Education

While this plan represents important steps in the right direction and seems to draw carefully upon the results of the many recent studies referred to earlier, it does not provide a clear statement of balance or priorities for science and mathematics education. We hope it will be possible for NSF to extend its analysis and planning to include objectives and general budget targets over the five-year time horizon, as was asked for by Congress over two years ago. Having said this, we must acknowledge the fact that NSF Director Bloch and the National Science Board have made much progress in the recent past along these lines.

Specific Comments on the FY 1988 Budget for Education

Some observers and participants point to the fact that, as Table I shows, in earlier crisis years science education accounted for at least 25 percent of the NSF budget. Drawing upon that benchmark, and concluding that today's problems are as serious as those of the 1960s, it is argued that the NSF science and engineering education budget should be in the range of $400 million in the FY 1988 budget as compared with the $115 million requested.

A key consideration for the Subcommittee and your colleagues in the Congress is a judgment on how serious is the educational crisis in this country with respect to science, mathematics and engineering education. The question is: "Are things as bad as they were in the late 1950s and 1960s? Or have we made progress in spite of the current documented problems?" My own view is that we have made progress, but that we must address our problems with a sense of urgency and in a strategic fashion.

In reviewing the FY 1988 budget we find ourselves rather puzzled. While we acknowledge the earlier mentioned increase of $91 million, we are concerned to see that no increase has been allocated to pre-college education. In an environment of high growth rates in the rest of NSF's budget, there is the inevitable conclusion about the relative lesser importance of pre-college education in NSF thinking.

International Institute for Applied Systems Analysis

We are disappointed and disturbed by the Administration's recent veto of program funding support for IIASA. This funding, which was reviewed and approved by NSF in January 1986 came to $500,000 from FY 1986 NSF appropriations. It would have provided some degree of support for IIASA research on the environment, aging populations and applied mathematics. Despite Congressional support for such funding -- as reflected in the NSF FY 1986 Appropriations Report language, despite the relatively small amount of funds involved, and despite the important and non-sensitive nature of the research there seems to remain political opposition to international scientific cooperation reflected in IIASA.

As one of the cosponsors of American membership in IIASA, the AAAS urges the Subcommittee to assure funding in FY 1988 at a level that will restore American influence on this unique and worthy international scientific research institution.

Biographical Information

Lawrence Bogorad

Lawrence Bogorad (plant molecular developmental biology), 1921; B.S., 1942, and Ph.D., 1949, University of Chicago. With Harvard University since 1967; Maria Moors Cabot professor of biology since 1980. Previously with Rockefeller Institute and University of Chicago. Member, National Academy of Sciences; NRC-NAS Merck postdoctoral fellow, 1951-53; Fullbright research scholar, 1960; NSF senior postdoctoral fellow, 1960-61; Quantrell Award, University of Chicago, 1960; USPHS Research Career Award, 1963-67; Stephen Hales Award, American Society of Plant Physiologists, 1982; president, ASPP, 1968-69, and Society for Developmental Biology, 1983-84. Curent activities: Editorial Boards, Plant Molecular Biology, Journal of Molecular and Applied Genetics, and Plant Cell Reports; Policy Advisory Group, U.S. Department of Agriculture Competitive Research Grants Program; Board on Agriculture, National Research Council; Advisory Committee for Biological, Behavioral, and Social Sciences, NSF. AAAS activities: member-at-large of the Section Committee, Section on Biological Science, 1977-80; Board of Directors and Council, 1982-86; President, 1986-87; and Chairman of the Board of Directors, 1987-88.

TABLE I

TABLE I

Estimated National Science Foundation Science Education Obligations By Function, By Year
(in millions of dollars)*

Fiscal Year	Total NSF dollars	Total SE dollars	Percent SE of Total	Functions*									
				R&D**		Students		Teachers		Institutions		Science and Society	
				%	$	%	$	%	$	%	$	%	$
1952	3.47	1.54	44.4	0	0	99.7	1.535	0.3	0.005	0	0	0	0
1953	4.42	1.41	31.9	0	0	98	1.38	2	0.03	0	0	0	0
1954	7.96	1.89	23.7	0	0	95	1.796	5	0.09	0	0	0	0
1955	12.49	2.10	16.8	3	0.06	88	1.85	10	0.21	0	0	0	0
1956	15.99	3.52	22.0	0.4	0.01	67	2.36	32	1.13	0	0	0	0
1957	38.63	14.30	37.0	7	1.00	21	3.00	72	10.30	0	0	0	0
1958	49.97	19.20	38.4	9	1.73	22	4.22	69	13.25	0	0	0	0
1959	132.94	61.29	46.1	14	8.58	24	14.71	62	38.00	0	0	0	0
1960	158.60	63.74	40.2	14	8.92	25	15.94	60	38.24	0	0	0.5	0.32
1961	174.99	63.44	36.3	15	9.52	24	15.23	61	38.70	0	0	0.5	0.32
1962	260.82	83.60	32.1	12	10.03	24	20.01	61	51.00	3	2.51	0.4	0.33
1963	320.75	98.72	30.8	15	14.81	27	26.65	55	54.30	3	2.96	0.4	0.39
1964	354.58	111.23	31.4	15	16.68	30	33.37	51	56.73	4	4.43	0.4	0.44
1965	415.97	120.41	28.9	13	15.65	36	43.35	44	52.98	7	8.43	0.3	0.38
1966	466.43	124.30	26.7	13	16.16	42	52.21	39	48.48	6	7.46	0.1	0.12
1967	465.10	125.82	27.1	17	21.39	38	47.81	38	47.81	6	7.55	0.3	0.38
1968	495.00	134.46	27.2	16	21.51	36	48.41	37	49.75	10	13.45	0.2	0.27
1969	400.00	115.30	28.8	18	20.75	37	42.66	34	39.20	12	13.84	0.2	0.23
1970	440.00	120.18	27.3	15	18.03	38	45.67	37	44.47	9	10.82	0.2	0.24
1971	513.00	98.81	19.3	23	22.73	38	37.55	35	34.58	4	3.95	0.4	0.40
1972	622.00	86.10	13.8	33	28.41	28	24.11	28	24.11	12	10.33	0.8	0.69
1973	645.74	62.23	9.6	34	21.16	34	21.16	21	13.07	11	6.85	1	0.62
1974	645.67	80.71	12.5	36	28.79	22	18.13	25	19.96	14	11.61	3	2.42
1975	693.20	74.03	10.7	35	26.65	26	19.00	24	17.90	13	10.00	2	1.49
1976	724.40	62.50	8.6	17	10.63	36	22.50	6	3.75	37	23.13	4	2.50
1977	791.77	74.30	9.4	15	11.15	31	23.03	11	8.17	38	28.23	5	3.72
1978	864.91	73.96	8.6	12	8.83	29	21.45	14	10.35	38	28.10	7	5.18
1979	928.40	80.00	8.6	14	11.20	28	22.40	13	10.40	36	28.80	8	6.40
1980	996.25	77.19	7.7	18	15.25	25	21.18	14	11.86	34	28.80	9	7.62
1981***	1,041.80	70.70	6.8		—		—		—		—		—

*The functional categories of obligations are exemplified as follows *Students* includes programs such as fellowships and precollege student science training *Faculty* includes programs such as teacher institutes and faculty short courses *Institutions* includes programs such as ISEP (equipment purchasing), LOCI (Local Course Improvement), and CAUSE (Comprehensive Assistance to Undergraduate Science Education) *Science and society* includes programs for improving the public understanding of science and studying the ethical issues in science and technology

**Until 1977 development projects received most of the R&D funding

***1981 Breakdown of obligations not available at time of printing.

Source Directorate for Science Education, National Science Foundation, unpublished data

FIGURE 1

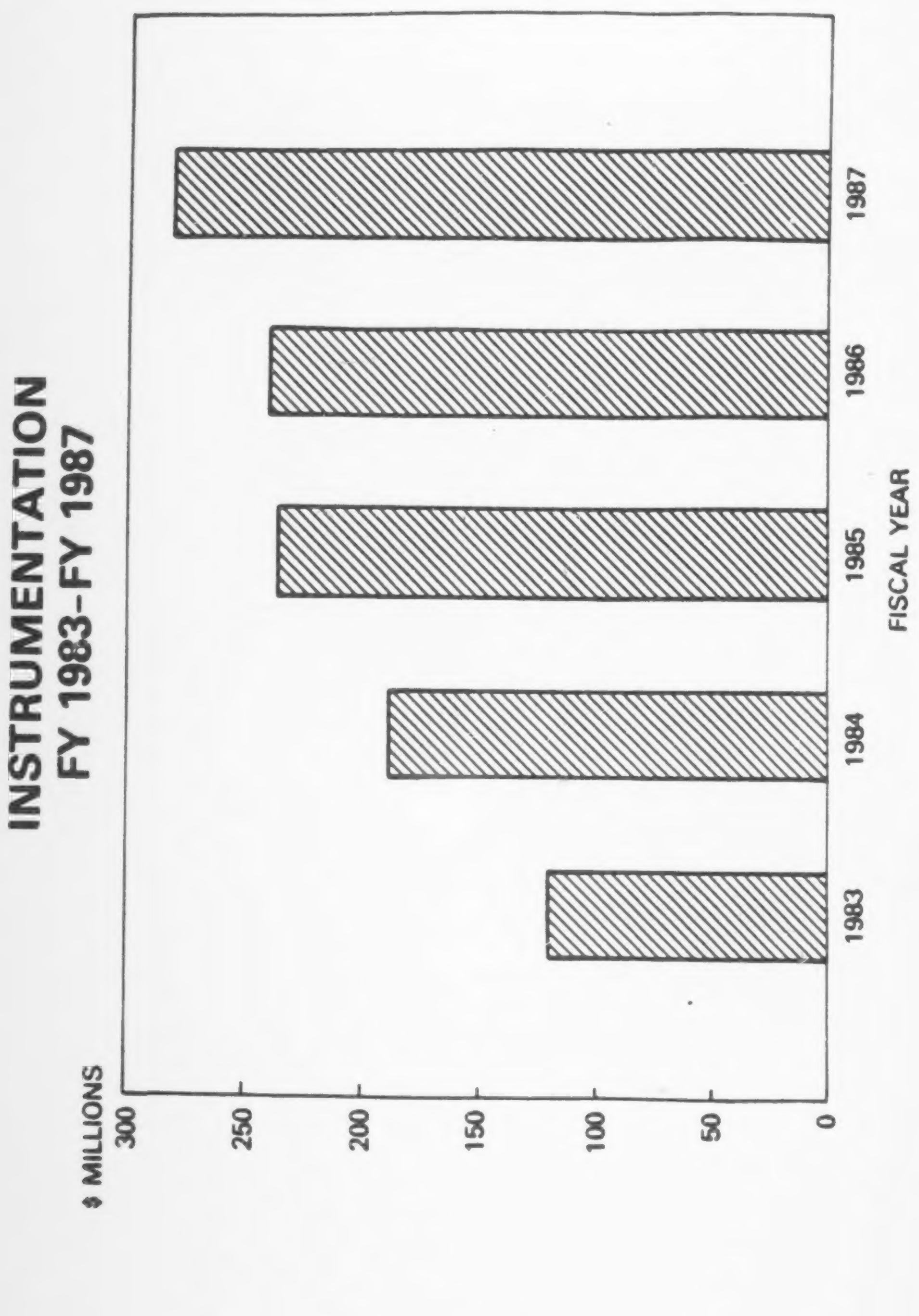
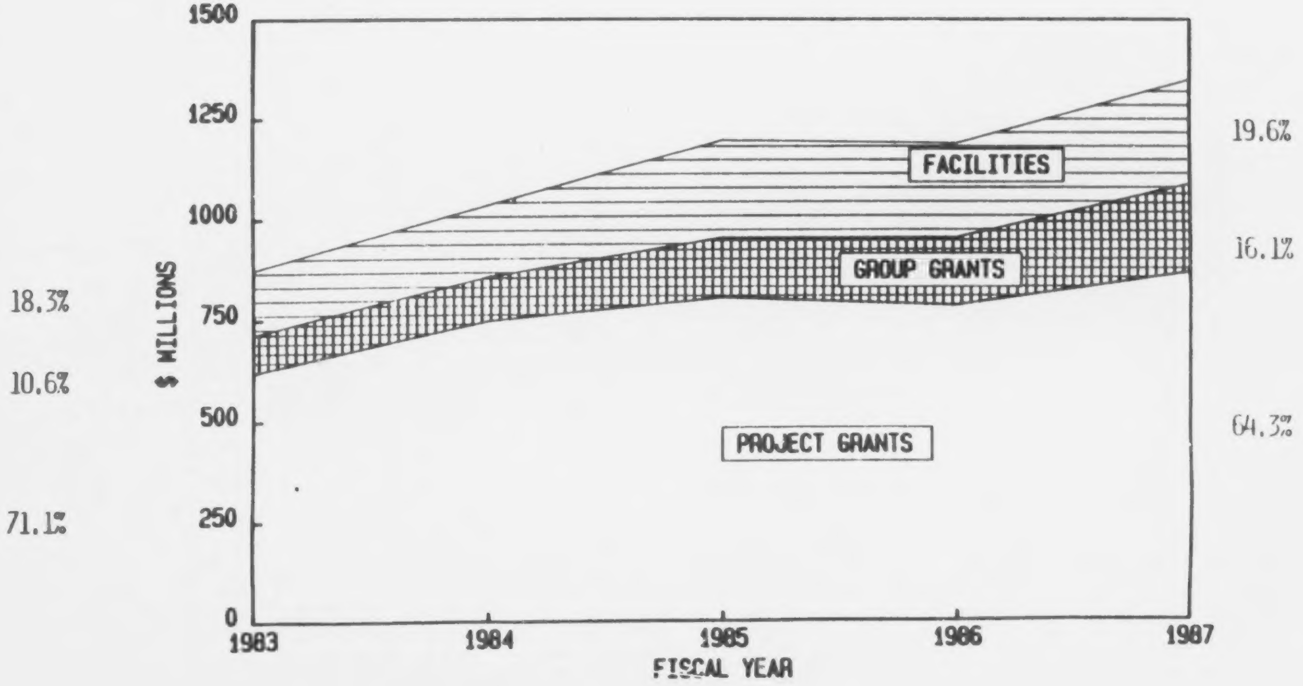

INSTRUMENTATION
FY 1983-FY 1987
$ MILLIONS
300
250
200
150
100
50
0
1983
1984
1985
1986
1987
FISCAL YEAR

FIGURE 2

NATIONAL SCIENCE FOUNDATION
PROJECT BALANCE

FY 1983 - FY 1987



* INCLUDES MPS, AAEO, BBS, ENG, & ASC ONLY

STATEMENT OF DR. JOHN K CRUM, EXECUTIVE DIRECTOR, AMERICAN CHEMICAL SOCIETY

BUDGET REQUEST SUPPORTED

Senator LAUTENBERG. Dr. Crum, we inflict the same painful restraint, unfortunately. I invite you to try to reduce and summarize your statement.

Dr. CRUM. Thank you, sir. My name is John Crum. I am the executive director of the American Chemical Society. We have over 137,000 members located in every state of the Union and in several foreign countries.

I am appearing before you today to highlight our written statement on the fiscal year 1988 appropriations for the National Science Foundation, and I request that the complete text of my statement be entered into the record.

Senator LAUTENBERG. Without objection.

Dr. CRUM. The American Chemical Society believes that basic research and science education are fundamental to the improvement of the economic strength of the country and that NSF has a crucial role in this endeavor. We therefore strongly support the administration's fiscal year 1988 budget request and the proposed doubling of the Foundation's budget over the next 5 years.

CHEMICAL RESEARCH

We are concerned, however, that the National Science Foundation's budget for chemical research is not receiving the high priority it deserves at a time when the opportunities for contributions by the chemical sciences to the economy are so favorable.

As a result of recent progress in our understanding of the elemental steps of chemical change and the rapidly advancing technology in various areas of instrumentation, the science of chemistry is entering a new era of highly productive inquiry.

Many areas of potentially high return from research are identified in the National Academy of Sciences report "Opportunities in Chemistry" which has gone to most Congressmen.

The chemical sciences will continue to make significant contributions to the nation's ability to improve its gross national product. In fact, chemical products comprise one sector of the U.S. economy that continues to produce a favorable trade balance. This strong showing is related to the existing cooperation among universities in the fields of chemistry, chemical engineering, and materials sciences, and to the well-developed communication channels between the universities and industry. This is important for the rapid application of science and technology to support national goals, and to address national problems.

ACS considers funding in chemistry, materials research, and chemical, biochemical, and thermal divisions of NSF inadequate to pursue those areas of greatest research potential or to educate and train the personnel needed by industry. So this support is crucial, since the Foundation is the primary source of funding for basic academic research in these fields. With more support, research in expanding areas such as high temperature superconducting materials will be developed more rapidly in the United States.

INDIVIDUAL INVESTIGATIVE RESEARCH

Individual investigative research is an extremely successful way to conduct chemical research in the universities and to train individuals. The affects of alternative funding mechanisms on the nature of the research environment should be carefully observed and evaluated as the mix of funding mechanisms has changed. In particular, we are concerned about the potential impact of the proposed science and technology centers on funding available for individual investigator awards.

The society also endorses the breadth of programming at NSF for science and engineering education. Such support is essential to educate the American public in our technological age, as well as to attract the brightest candidates to scientific careers.

New moneys over the fiscal year 1988 request of $115 million are needed for the Science and Engineering Education Directorate. Further, NSF investment is needed to enhance activities in the precollege teacher training, curriculum development at the precollege and college level, and in college laboratory instrumentation.

We thank you for this opportunity to testify today, and I would be pleased to answer any questions.

Senator LAUTENBERG. Thank you very much, Dr. Crum.

[The statement follows:]

STATEMENT OF DR. JOHN K. CRUM, ON BEHALF OF THE AMERICAN CHEMICAL SOCIETY

Mr. Chairman and Members of the Subcommittee:

My name is John K Crum. I am Executive Director of the American Chemical Society. I appear before you today with the authorization of the Society's Board of Directors to highlight the ACS statement on the FY 1988 appropriations of the National Science Foundation. I request that the complete text of the ACS statement be entered into the hearing record.

Recent events within both the Congress and the Administration have focused on the central role of education and basic research in advancing the economic competitiveness of the United States. As one means to achieve the excellence for which the Nation is striving, the American Chemical Society urges the Subcommittee to support the National Science Foundation's budget at least at the Administration's requested level of funding. Further, Congress must sustain the five-year commitment to double the Foundation's budget by FY 1992 to develop a scientifically educated public and a knowledge base upon which this Nation can build its economic future.

The Society's other major comments concerning the proposed NSF budget are:

- The ACS is pleased that there are proposed increases for the Divisions of Chemistry; Materials Research; and Chemical, Biochemical, and Thermal Engineering.

  However, funding of NSF's Chemistry Division has been and, unless action is taken, will continue to be inadequate to exploit the enormous research potential of chemistry as delineated in the National Academy of Sciences/National Research Council Report, Opportunities in Chemistry.

  Also, funding levels proposed for NSF's Materials Research and Chemical, Biochemical, and Thermal Engineering Divisions are insufficient to meet the needs of the academic infrastructure in these areas.

- The impact on the health of various scientific fields by the Science and Technology Centers approach as well as other Foundation-wide funding mechanisms should be monitored and evaluated.

- Although the ACS applauds the Foundation's $115.0 million commitment to the Science and Engineering Education Directorate, the Society also believes that increased support of $12.0 million over the budget request is urgently needed for enhanced activities. This proposed increase should be new monies added to the FY 1988 budget request for the Foundation.

The American Chemical Society hopes that our comments will be useful to the Subcommittee. The accompanying Appendix outlines the above points in greater detail.

*** APPENDIX ***

National Science Foundation Budget

Technological progress is rooted in our Nation's investment in research and education, particularly at universities and colleges. Since the National Science Foundation provides a majority of the federal support for basic research in certain disciplines performed in academia, the health of these institutions will be highly dependent on real growth in the NSF budget. The American Chemical Society supports the federal commitment to a doubling of the budget of the National Science Foundation in five years starting with FY 1988.

Chemistry Division

Although the ACS is pleased that the Chemistry Division receives an increase in the FY 1988 budget request, we also are dismayed at the insufficient support for the chemical sciences within this budget. In proportion to its contribution to the economy, chemistry has been and is currently underfunded. Historical tables show that, in constant 1972 dollars, NSF funding for the Chemistry Division during the period FY 1985-88 increases an average of less than one percent annually. Recognizing that it will be difficult to remedy this situation for FY 1988, the Society urges that a higher priority be given to funding for chemical research in future NSF budgets.

Chemistry is a central discipline from which other sciences flow. The chemical sciences are a major contributor to high technology industries, such as computers, electronics, robotics, and biotechnology. Chemists and chemistry are needed to synthesize, characterize, and transform advanced materials, such as superconducting polymers, composites, and ceramics. An estimated 40 percent of the U.S. GNP (including food production and energy technology) is derived from the chemical sciences. During the past five years, the chemicals and related products industries have brought the U.S. a favorable trade balance of $8.8 billion per year. Over 130,000 chemists are employed by U.S. businesses, more than any other scientific discipline. Increased scientific and technological leadership by the U.S. will depend upon renewed support for research in the basic chemical sciences as well as support mechanisms that provide experienced personnel for the chemical and allied industries.

The NSF FY 1988 budget request for the Chemistry Division is 9.9 percent above the FY 1987 level, compared to the overall increase for the Research and Related Activities Directorates of 16.3 percent. To understand the significance of the proposed Chemistry budget, prior funding patterns and future potential growth must be examined.

FY 1986

Due to the triggering of the provisions of the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Control Act, a 4.3 percent budget cut was sustained by the Chemistry Division during FY 1986. The Division dealt with this reduction by delaying purchases of major instrumentation and shortening the period of funding of some continuing grants. This reduction was completed with the expectation that future funding increases would make up the difference.

FY 1987

In FY 1987, NSF proposed an initiative in the chemical sciences in direct response to the many opportunities for research advances and societal benefits delineated by the National Academy of Sciences/National Research Council (NAS/NRC) Report, Opportunities in Chemistry. Unfortunately, the proposed increase for the Chemistry Division was halved due to a cut associated with action on the NSF budget request. Further, delayed approval of appropriations made it extremely difficult for research investigators to find funding elsewhere in order to maintain continuity and stability in research groups.

Within this revised budget for FY 1987, the Division supports agency-wide initiatives such as collaborative research, the Experimental Program to Stimulate Cooperative Research, Presidential Young Investigators, biotechnology, computer science and technology, and development of human resources activities. The Special Projects activity, which includes multidisciplinary research, and the Chemical Instrumentation Program received the largest increases over the FY 1986 level. In order to expand activities in these agency-wide areas, most continuing grant amendments will be reduced in FY 1987 below the levels provided in FY 1986. Also, the number of awards is likely to drop below the FY 1986 level. The ACS has learned that senior investigators have had to cut graduate student or postdoctoral support to accommodate this reduction in funding.

FY 1988

With the FY 1988 budget, the Chemistry Division is still playing catch-up to try to adequately support the individual investigators while simultaneously funding Foundation-wide activities. These latter activities include exciting areas of multidisciplinary research--chemistry of life processes and materials chemistry, with a new emphasis on the chemistry of thin films and interfaces. (Interfaces are the physical junctions where two different substances or phases of one substance meet.)

The proposed increase for FY 1988 focuses largely on agency-wide activities and on increasing the number and amounts of stipends for postdoctorals and graduate students. This increase provides inadequate support to chemistry's underlying subdisciplines; too many excellent proposals from individual research investigators will be unfunded or underfunded. A five-year plan in shared instrumentation--proposed in FY 1987 to fund ongoing maintenance and operations--also will be on indefinite hold.

Under the above funding scenario, the enormous research potential indicated by the NAS/NRC Report on Opportunities in Chemistry will not be fully exploited. Chemistry's contribution to the Nation will not be fully realized unless the base funding support for research in the chemical sciences is increased and maintained in the future.

Materials Research and Chemical Engineering

As mentioned previously, the chemicals and related products industries still have a positive trade balance. This strong showing is related to the academic infrastructure in the fields of materials science and chemical engineering as well as in chemistry. These interrelated fields are connected to industrial needs and their communication channels with industry are well-developed. This communication is an important factor in technology transfer from university to industry.

The health of academic research and education in materials science and chemical engineering is essential to continued U.S. economic competitiveness in the chemical and allied industries. NSF is a primary player in assuring this health: the Foundation funds about 50 percent of the materials research and 84 percent of the chemical engineering research conducted with federal funds in academia.

The American Chemical Society is encouraged to see that increases are proposed for these fields in NSF's FY 1988 budget request. However, these increases do not reflect the importance of these fields to new technological advances in biochemicals, electronics, and advanced materials. Of grave concern to the Society is that the 10.1 percent growth proposed in FY 1988 for NSF's Materials Research Division and the 10.9 percent growth in the Chemical, Biochemical, and Thermal Engineering Division is inadequate to maintain the momentum of academic activities in these areas. In fact, the latter Division does not share in the large increase of 25.7 percent proposed for the Engineering Directorate. Both these Divisions have pressures on them, equivalent to those described for the Chemistry Division, which draw resources away from research project programs to agency-wide activities.

The Materials Research Division has a number of programs such as Polymers and Solid State Chemistry that support research that employs the principles and practices of chemistry. The Materials Research Division also supports the Materials Chemistry Initiative, along with the Chemistry Division, and a Materials Processing Initiative to be carried out jointly with the relevant engineering disciplines.

The Chemical, Biochemical, and Thermal Engineering Division has several thrusts in process engineering. A new emphasis is on advanced modes of process operation to produce high-valued, fine chemicals. Also, enhanced research is being funded on thermal processing in conjunction with the Materials Engineering and Processing program. These research thrusts indicate the continuum of chemistry, materials science, and chemical engineering, and their importance to providing the knowledge base and trained personnel needed by both established and new industries.

Multidisciplinary Research Centers, Individual Investigators, and Other Funding Mechanisms

The American Chemical Society commends the Foundation for proposing its innovative science and technology research centers concept. NSF foresees that the multidisciplinary research centers approach will accelerate scientific progress in areas that are intellectually challenging as well as economically promising, will involve strong industrial participation as well as technology transfer, and will provide unique opportunities for education and training.

The centers are expected to attract funds from contributors such as industry and state and local governments. These contributors may participate in the research conducted under these centers, and in the determination of the relevance of problems to industrial technologies. The centers approach will help to address instrumentation needs in academia since it will provide for the acquisition and sharing of high-cost instruments and other equipment as well as for instrumentation development. Additionally, numerous scenarios could be drawn for the establishment of other mechanisms such as visiting faculty and cross-directorate postdoctoral appointments to enable faculty and students to gain experience at these centers.

The factors that make this approach work will vary considerably from discipline to discipline and will depend on the industries involved. NSF already has invaluable experience from the Engineering and Industry/University Cooperative Research Centers as well as from multidisciplinary groups. The ACS sincerely hopes that the Foundation's expectations in this area are fulfilled.

However, the ACS would like to raise some concerns. The Society believes that NSF should closely monitor the Science and Technology Centers approach and other agency-wide activities to determine any impacts on the health of the disciplines, in particular on individual investigator research. While strong disciplinary basic research is an important component of education and training, and provides a necessary foundation for multidisciplinary, multi-investigator research, the centers and other collaborative research groups will change the nature of the research environment. This change should be carefully observed and then evaluated.

Multidisciplinary, multi-investigator research and other Foundation-wide activities will compete for limited research dollars with more "traditional" disciplinary program elements, including individual investigator awards. The Foundation must continue to select proposals for funding on the basis of excellence. Consideration should be given to the quality of research being conducted regardless of the mechanism of support. Finally, the success of each Foundation-wide activity must be judged in order to decide how best to allocate NSF resources.

Science and Engineering Education

The American Chemical Society applauds the Foundation's proposed increase of 16.1 percent for the Directorate for Science and Engineering Education (SEE). This increase is an indication of NSF's strong commitment to science and engineering education. The Society recognizes, as does the Foundation, the extreme importance of designing programs that address the educational needs of those students who do not intend to become professional scientists, mathematicians, and engineers as well as the needs of the many students who do. The Society commends the Directorate for the thoughtful and timely manner in which new programs have been initiated and implemented over the past several years. Especially noteworthy is the recent emphasis on middle and elementary school science and mathematics.

The leadership exhibited by NSF also has sensitized scientists from business, industry, and academe to their opportunities and obligations to interact with government and the science, mathematics, and engineering education establishment to promote standards for science and mathematics instruction in the Nation's schools. Many scientific and technological associations have created their own infrastructures to address school concerns at the local level.

These organizations view the NSF as the only appropriate focus for the continuum of science and mathematics education programs from kindergarten through high school, to college and beyond.

In ACS's view, the greatest problem facing precollege science and mathematics education is the shortage of subject-matter competent teachers. This situation is being addressed by SEE through programs that focus upon improving the preservice education of incoming science and mathematics teachers, as well as improving the performance of teachers now in the classroom. Both approaches are vital. However, the Society believes that the funding of these efforts in the FY 1988 budget, which is level with FY 1987, will only begin to relieve national needs in this area.

The ACS also is very concerned that, within the SEE Directorate, no new funds have been proposed for curriculum development at the precollege level, nor at the college level. At the precollege level, there is a need to support the development of innovative courses designed to attract more students to the sciences. Most existing course offerings are at least twenty-five years old and are a result of the post-Sputnik "golden age" of concern for science education. Not only has science moved forward since that time, but so has our understanding of how to teach science to a wider spectrum of students. Greater efforts are needed now to ensure that innovative courses are produced for all the sciences.

Given our appreciation of the continuum that is science education, the ACS believes that curriculum development at the precollege level will, sooner or later, catalyze much needed reform at the college level. Thus, the Society was disappointed that the FY 1988 SEE budget did not contain funds to promote forward planning and to explore the need for college science curriculum development, particularly for the first two years of the undergraduate experience. The ACS applauds the $7 million assigned to the research directorates for curriculum development in calculus and engineering, but believes these activities are not sufficient at this time.

The ACS is gratified that NSF is responding to the recommendations of the recent "Report of the NSB Task Committee on Undergraduate Science and Engineering Education." The Society is convinced that the concerns expressed in this document accurately describe a rapidly deteriorating situation in our institutions of higher learning. Given the well-recognized deficiencies in laboratory instruction, faculty preparedness, and curricula, ACS firmly supports the establishment of NSF programs to strengthen undergraduate science, mathematics, and engineering education. The Society believes that it is very important to involve the research community in efforts to improve undergraduate science education as it is to involve the SEE Directorate. However, the ACS would caution the Foundation to structure its efforts in support of undergraduate education in as multi-faceted a manner as possible. Undergraduate research opportunities are important, but they satisfy only a part of the need at the undergraduate level.

Although the American Chemical Society applauds the addition of $3 million to the SEE Directorate in support of faculty enhancement, the Society is concerned that the College Instrumentation Program will receive only level funding from FY 1987 to FY 1988. The budget information available does not make it clear to what extent the funds in the research directorates will be utilized for faculty enhancement and undergraduate instrumentation.

Given the budget exigencies under which NSF must operate, the Society recognizes that the SEE role must be limited to leadership activities, and to the support of model programs. Nevertheless, in spite of the federal budget deficit, the Nation must continue to expand its commitment to science, mathematics, and engineering education in order to advance as a modern society. The relationship between technological literacy and economic competitiveness in world markets is now well recognized. History has taught us that once the full extent of a problem is recognized, nations must plan for its long-term solution. Thus, the ACS supports the breadth of programming within the SEE Directorate, including the proposed $16 million increase for new program initiatives. The Society however urges an increase of $12 million in funding beyond that proposed, distributed to enhance the areas indicated above. This increase in funding for SEE should be new monies added to the FY 1988 budget request for the National Science Foundation.

STATEMENT OF GEORGE PAGE, SCIENCE EDITOR AND PRODUCER, "NATURE," WNET-RADIO; NATIONAL ASSOCIATION OF PUBLIC TV STATIONS

PUBLIC SCIENCE EDUCATION

Senator LAUTENBERG. Mr. Page?

Mr. PAGE. Thank you, Mr. Chairman.

My name is George Page, and I am director of a science and natural history program at WNET-Channel 13 in New York, which, as the chairman knows, is licensed in the great state of New Jersey.

Senator LAUTENBERG. It does wonderful work, too, I must say.

Mr. PAGE. I am also host of a public television series called "Nature."

I am testifying today to urge you to continue to provide adequate funding levels for fiscal year 1988 to the National Science Foundation, specifically for its efforts to enhance public science education.

In the early 1980's at WNET, we set up a new production unit that would create programs to bridge our widening gap of scientific illiteracy in this country. We believe that television could structure scientific information in a way that was easily digestible yet comprehensive and accurate, information that could be made available to millions.

"THE BRAIN"

The initial result of that effort at WNET was "The Brain," an eight-part series that first aired on public television in 1984 and that each week reached between 6 and 10 million viewers, with vivid portrayals of how our brains really work and what was being done on the frontiers of science to see that they work even better. The series, which reached millions more through telecourses and books, told us how these discoveries could make a difference in our everyday future and present lives. The series was a critical viewer and educational success.

It was in that initial effort that the National Science Foundation participated. Indeed, without them there would have been no initial effort.

The NSF, to our delight, first grasped the importance of the project, a television enterprise that was grand by public television standards, a $7.5 million exploration.

The NSF knew it couldn't fund the entire amount, but it did serve as a catalyst, a stamp of approval, a far-sighted pioneer for others to follow, and so it has done again and again. They granted us $250,000 to pursue our series. Its seed moneys took root. Other governmental agencies, foreign television consortia, private foundations, and public corporations followed suit, and the series blossomed.

"THE MIND"

Today we have two other projects which have also taken root, thanks to the initial seed money from NSF: "The Mind," a nine-part series, will air on public television in the fall of 1988. The NSF's $500,000 grant spurred $7 million in other funds from other sources. That series ventures where "The Brain" series left off. In it we will present a guided scientific exploration into the realm of the mind, noting the links between the physical brain and human behavior.

Thanks to those early NSF moneys, we plan to provide educational materials, books, and courses that will accompany the television presentation, materials that will reach every single high school science student in this country. We couldn't do it without the NSF moneys, and we couldn't do it with the NSF moneys alone. It is the perfect kind of federal funding catalyst for these deficit-worrying times.

"CHILDHOOD"

Finally, another project, a 10-part series on childhood, will air in 1991. We expect approximately $700,000 from the NSF for that effort, again, as first moneys, but not as last moneys. "Childhood" will take us on a cross-cultural expedition through how we raise our children, looking from a variety of viewpoints at what we have learned over the past 20 years about child rearing, about the stages of child development, about how we learn and how we teach.

The NSF has played an important role in the continuing drama of American democracy. We are delighted. It has fostered the possibilities that television, communication, and education together play in that effort.

Thank you very much, Mr. Chairman.

Senator Lautenberg. Thank you, Mr. Page. Again, I feel terribly guilty at having to condense this into so little time. Dr. Crum, with his chemical association in New Jersey has a big presence there in WNET.

[The statement follows:]

STATEMENT OF GEORGE PAGE, SCIENCE EDITOR AND PRODUCER, WNET-RADIO; NATIONAL ASSOCIATION OF PUBLIC TV STATIONS

The National Association of Public Television Stations (NAPTS) is pleased once again to present testimony in support of the important educational programs funded by the National Science Foundation's (NSF). Our membership, the nation's public television stations, has utilized funds from NSF to present to the American public high quality science education television programming. We have been grateful for this important federal support which has responded to the clear need for science and mathematics education nationwide.

The Congress and the American public continue to view with alarm the state of science and mathematics education at all levels from elementary to post-graduate. There continues to be a critical national shortage of qualified math and science teachers, and higher levels of science education are losing ground in their struggle to keep up with technology.

Alarming though these trends may be, there has been in recent years a concerted effort by the government to encourage the study of these vital fields by our nation's young people. An important part of this effort has been the nation's public television stations, whose many science programs continue to attract large audiences at home and in the classroom.

We in public television have seen a tremendous response to the many science programs, some of them supported by NSF, that our stations produce and distribute. Science programs distributed by the Public Broadcasting Service (PBS) reach some 18.5 million households--or 46 million viewers--in this country every week. Science and nature programs, with subjects ranging from tigers to sharks to the human brain, represent the top four spots on the list of all time most-watched PBS evening programs. And, taken as a group, science programming on public television geared for all age and education levels attracts more viewers than public affairs or cultural and entertainment programming.

By providing innovative, high quality science programming free to its viewers, public television is not only filling a void for this kind of programming not found regularly on other stations, but it is responding to the hunger the American people have for science education.

Our eight-part landmark series The Brain, partially funded by NSF's Science and Engineering Education Directorate (SEE), first ran in 1984 to wide critical and academic acclaim. This series' overwhelming success has pointed very clearly to how the cooperative efforts of the federal government's science-related agencies and the public television system can combine to produce needed, academically-oriented and well-received science programming.

Due to its extraordinary success, a sequel to the series entitled The Mind has now commenced in production for a projected airing in the 1988-89 season. The new series will focus not only on the science of the brain itself, but on what role the brain plays in human development. The interdisciplinary approach used will feature such topics as aging, addiction, communication, and thinking.

WNET/New York, the producer of the series, has already received an extraordinary advance commitment of $1 million from the nation's public television stations to purchase and carry the series when it is completed. More important, however, is the commitment of $500,000 the series producer has received from NSF. The highly technical nature of the series, involving the consultation of top-level scientists and the use of advanced video animation, translates into high production costs, in this case estimated at over $8 million for nine one-hour programs. The importance of the support of the NSF in such a monumental undertaking cannot be overestimated.

The original The Brain series has been adapted for use by many two and four-year colleges and universities as a credited course, "Brain, Mind, and Behavior." Its successor will also be used for strictly educational purposes during and after its original broadcast for both secondary and post-secondary institutions.

The weekly science series NOVA produced by WGBH/Boston, received initial important NSF support in 1972 and was continually nurtured by the NSF until our stations could afford the programs' cost themselves. Three NOVA programs appear on the list of most-watched programs in PBS history; the series is regularly seen by as many as 20 million Americans per broadcast. Nearly 95,000 high school teachers use the series to educate over 10.5 million students nationwide, making them the most widely used PBS programs as instructional television in our nation's schools.

In the area of children's science and math educational television, the NSF has helped make possible the development and production of 3-2-1 Contact and the new math series Square One TV. Both of these series are geared to the 8 to 12-year-old viewer, and both are produced by the Children's Television Workshop, producer of Sesame Street and The Electric Company.

Square One TV premiered on public television in January of this year after CTW spent years in researching and producing 75 half-hour programs that would hold the interest of children while teaching mathematical concepts. The design of Square One TV was made by close collaboration of producers, researchers, academics, and children. Teachers will be able to use the show both in the classroom to supplement their lessons or as homework to reinforce mathematical skills. Funds from the NSF and the Department of Education were crucial to the development of this show, as well as in attracting financial support from the Andrew W. Mellon Foundation, the Carnegie Corporation, and the IBM Corporation.

3-2-1 Contact is carried on 218 of our public television stations and is seen by 7.5 million viewers each week. NSF provides partial funding for the series, $1.5 million per year, along with substantial funding help from the U.S. Department of Education in order to allow for the yearly production of new episodes to the series. The series is designed not only to educate young people in science subjects, but also to encourage their interest in scientific study. Over 750,000 elementary school teachers receive the program's companion teacher guide, and science museums and schools have established weekend activities to support and extend the enthusiasm created by the program.

A continuing funding commitment from the NSF will allow another of public television's very successful children's series to expand its scope. Reading Rainbow, the highly acclaimed summer reading series hosted by LeVar Burton is co-produced by Great Plains National Instructional Television Library and public TV station WNED/Buffalo, New York, in association with Lancit Productions, New York City. This series has now received a commitment from NSF to add special science programs to the series. NSF awarded the series $200,000 in the last fiscal year for five new programs featuring science reading, and another $200,000 for five more for this year. Other major funders include the Corporation for Public Broadcasting (CPB), B. Dalton Booksellers, and the Carnegie Corporation.

Reading Rainbow has already prompted measurable interest in summer reading by children nationwide. According to the results of a survey completed by RMC Research of children's librarians, 46% of those surveyed reported an increase in summer reading prompted by the series, 67% of the librarians attributed at least some degree of increase in book circulation to the series, and most importantly, 75% believed the series also stimulated parents' interest in children's reading. The results of this national survey paint Reading Rainbow as an unqualified success from the perspective of children's librarians and energetic in the sense of overall activity in homes and libraries as children and parents have made the connection between television viewing and the enjoyment of reading good books.

With the addition of new science programs to the series, it will be possible to generate more enthusiasm for science reading and learning during the school vacation months.

Starting in September, 1987, Solve It will be beamed into America's 6th grade classrooms, a first-time NSF/SEE grant to the Agency for Instructional Technology, (AIT) Bloomington, Indiana, intended as direct classroom instruction in mathematics. NSF provided $497,000 of Solve It's $1.165 million budget, with the rest coming from the education departments of twenty-two states. Solve It consists of eighteen 15-minute math lessons, and is the third in AIT's trilogy of Math for the 80's series.

We are all too well aware of our need to upgrade science teaching nationwide. From our perspective in public television, this situation is as unfortunate as it is unnecessary. The program production and distribution capabilities of this nation's educational television system offer a unique resource for the improvement of elementary and secondary science and mathematics education on a wide scale and in a cost-effective manner. Because our system reaches about 95% of the U.S. population, it is especially well-suited to reaching vast numbers of people as well as targeting specific pockets of students. Public television stations can develop and provide a comprehensive package of teacher-training materials--programs that can be used as in-service teacher training or as college-credit courses.

Public television also needs more college level courses, not just for our teachers, but for others in the workforce who need to upgrade their education. PBS's Adult Learning Service (ALS) is doing just that. By providing "telecourses"--college-level television series supplemented and reinforced with textbooks, study guides, and class meetings--PBS is reaching half a million college and university students at over 750 institutions of higher learning across the country.

A recent survey commissioned by the CPB/Annenberg Project of ALS students found that over two-thirds of the students were female, only 23 percent of the students were of traditional college age (18-22 years old), most were in 23-29 year old categories, and the proportion of women increased with age. The survey also showed tht 40 percent of the students in telecourses enrolled because an on-campus section of the course would conflict with their work schedules.

As stated previously, the series The Brain is the basis for the television course Brain, Mind and Behavior currently offered by the ALS. A physics course produced by the California Institute of Technology and the Southern California Consortium and offered by ALS this year, The Mechanical Universe, is attempting to provide three levels of physics instruction, one of them in cooperation with NSF. The Mechanical Universe can be geared either to liberal arts students fulfilling a general science requirement, to the science or engineering majors demanding more rigorous preparation, or to the secondary school teachers seeking to upgrade their physics teaching skills.

NSF has sponsored this last application by initiating a project in which parts of the course have been adapted for use in high school classrooms. Teachers who find themselves teaching high school physics in spite of inadequate preparation will find that by enrolling themselves in The Mechanical Universe course and using the NSF video modules in their classes, they will be able to present their students with instruction of the highest quality.

Because of the success of The Mechanical Universe, the CPB/Annenberg Project is now developing a pilot for The Chemical World, a one-semester television course in introductory chemistry for non-science majors. Projects like this and the teacher guides accompanying it would also benefit from NSF support.

In Arizona and South Carolina, public television stations are providing graduate level technological, engineering and business administration courses. In Arizona, these courses are being used by IBM, Burr Brown, Hughes, Motorola and other electronics firms as well as the Army's electronics facility at Fort Huachaca and Sierra Vista. In South Carolina, 60 percent of the graduate degrees in business administration and engineering that are conferred by the University of South Carolina each year go to these telecasting students. This service helps our nation's workforce and servicemen and women improve their skills and fosters our nation's international industrial competitiveness as well.

With the steady support of NSF through the years, public television has provided high quality science programming that equally fascinates and educates its intended audience. Our audience response has shown us that we need to develop more regular series like NOVA that explore new technology and scientific innovation and more limited series like The Brain and The Mind that explore specific scientific fields. The tremendous success of Square One TV, 3-2-1 Contact, and our college courses has shown that more efforts in those areas can help conquer "science fear" in our nation's student body.

The critical assistance and guidance provided by the National Science Foundation's Science and Engineering Education Directorate will continue to be necessary to achieving those goals. We note that NSF did not ask for an increase in the budget of the division which provides the funds for these media projects. Other divisions show substantial requests for increases. We believe that the success of these TV projects suggests the need for reasonable increase in this category at NSF. These projects are an important part of NSF's overall education strategy in strengthening America's science and math education at both pre-college and higher eduction levels.

We are also aware that the U.S. Department of Education has previously and, in our view, wisely, matched funds with NSF on several of these media projects, including 3-2-1 Contact and Square One TV. At this time there appears to be doubt that the Department of Education will continue in this way. We recommend that the Congress encourage the Department of Education to continue its participation in this very useful manner.

We urge you to appropriate as much as you can for the work of the National Science Foundation and that NSF be encouraged to direct as much as they can to using our nationwide system of public television stations to help bring more science information and education to all Americans.

Thank you.

STATEMENT OF DAVID BRITT, EXECUTIVE VICE PRESIDENT, CHILDREN'S TELEVISION WORKSHOP

SCIENCE AND MATH EDUCATION

Senator LAUTENBERG. If you would, please, Mr. Britt, we invite you now to talk on another subject of great interest, The Children's Television Workshop. I hope that you know that Senator Wirth and I have been very interested in children's TV and the quality of it.

Mr. BRITT. Indeed I do, Senator, and we certainly appreciate your efforts to try to make that better all around. Your leadership has been very important in that area.

I am David Britt, executive vice president of the Children's Television Workshop, and I am here to urge you to appropriate adequate funds for the National Science Foundation to continue its vital support of science and math education.

Specifically, I want to urge that the Materials Development and Informal Science Education Division receive a higher level of funding.

"3-2-1 CONTACT" AND "SQUARE-ONE TV"

The workshop has a direct interest in these appropriations. NSF is committed to support the next two seasons of "3-2-1 Contact," our educational television series that makes science more appealing and understandable to millions of 8- to 12-year-old viewers.

NSF also provided $5 million toward the first season of CTW's new series on mathematics, "Square-One TV," also for 8- to 12-year-olds. This series aims to harness the power of television to model problem-solving skills and introduce math concepts in an appealing way.

Season one of "Square-One TV" was made possible by a unique funding partnership led by NSF among government, CPB, foundations, and private enterprise. We are now requesting funding for a second season to build on that success, and NSF support will be essential to leveraging funds from nongovernmental sources.

"Square-One TV" is the first significant addition of new programming to the PBS children's block since "3-2-1 Contact" started back in 1980. At a time when commercial television provides no daily children's programming, the importance of our series is even greater.

We live in a society where the need to understand mathematics and science is growing every day. The technology-based economy offers rewards and opportunities to those who master these subjects, and it can sharply limit opportunities for those who do not.

"Square-One TV" and "3-2-1 Contact"" represent an effort to help address the national crisis in mathematics and science education.

NEGATIVE ATTITUDES

The pattern we are seeing is that children come into school liking science and math; but, by the time they leave the system, they dislike it and they know nothing about it. It is too late to start working on this problem by high school, because negative attitudes get rooted in the elementary school years, and that is, of course, where we target "3-2-1 Contact" and "Square-One TV," at children when they are still open-minded enough to listen and learn, we hope.

We reach children primarily in their homes. Whether one likes it or not—and most of us don't like it—children watch a lot of television. Without programs such as "3-2-1," "Square-One TV," and other shows in the PBS children's lineup, the daily alternatives available for children—as you know well, Senator—are mostly mindless entertainment at best. With your continued forceful support, this powerful medium will continue to be used for constructive educational purposes that benefit all of our children.

Your support of our programs is adding hours to each school day and indeed to each school year. Our programs supplement and complement classroom instruction. We want to continue these efforts to help improve science and math education. The Science Education Program at NSF, especially the Materials Development and Informal Science Education Division, needs and deserves your continued support.

Thank you, sir.

Senator LAUTENBERG. Thank you very much. I haven't met a presentation here I haven't liked, I can tell you that.

[The statement follows:]

STATEMENT OF DAVID V.B. BRITT, EXECUTIVE VICE PRESIDENT, CHILDREN'S TELEVISION WORKSHOP

Mr. Chairman and members of the Subcommittee:

Thank you for the opportunity to appear before you today. I am here to urge this Subcommittee and the Congress to appropriate an adequate level of funds for fiscal year 1988, to enable the National Science Foundation to continue its vital support of science education, including math, a basic building block of science. I specifically urge that the Materials Development and Informal Science Education Division receive a higher proportion of NSF's funds.

Children's Television Workshop has a direct interest in these appropriations. The National Science Foundation (NSF) has committed to support, at the level of $1.75 million per year, the next two seasons of 3-2-1 CONTACT, our educational television series that aims to make science more appealing and understandable to its millions of 8-12 year-old viewers.

The NSF also provided $5 million toward the first season of a new Children's Television Workshop series on mathematics -- SQUARE ONE TV -- also for 8-12 year-olds, which premiered on public TV stations on January 26, '87. This series helps address the national crisis in math education by using the power and impact of television:

-- to promote enthusiasm for and interest in mathematics;
-- to encourage the use and application of problem-solving strategies in mathematics;
-- and to present sound mathematical content in an interesting and meaningful way.

The series consists of 75 half-hour programs and has been received extremely well by educators, parents and the press. Most importantly, these programs are now at work every day to add new opportunities to learn about mathematics to millions of children around the country.

Season I of SQUARE ONE TV was made possible by a unique funding partnership, led by NSF, among government, CPB, foundations and private enterprise. We are now requesting funding for a second season of SQUARE ONE TV, in order to build on the success and excitment the series has achieved to date. We are hopeful that NSF will favorably respond to our request. Their support will be essential to leveraging funds from non-government sources.

SQUARE ONE TV is the first significant addition of new programming to the PBS children's block since 3-2-1 CONTACT started in 1980. At a time when commercial television provides no daily childrens programming, the importance of such educational programming is even greater. CPB has provided substantial support to both these series .

We live in a society where the need to understand and use mathematics and science is growing every day. Technology is the central building block of modern industrial and scientific innovation. A technology based economy offers rewards and opportunity to those who are able to master its complexities -- and sharply limited opportunity to those who do not.

Whether or not we provide children with an adequate foundation in math and science will affect their lives as individual citizens as well as our nation's ability to compete in the international marketplace. When children are grown and looking for jobs, many are likely to qualify only for lower level positions unless they have mastered a certain level of mathematics and science. And the pattern we're seeing now all too frequently is one where children in general, and females and minorities in particular, come into the school system liking science and mathematics, but leave the school system disliking and ignorant of those subjects.

SQUARE ONE TV and 3-2-1 CONTACT represent a national effort to help turn around our national failure in educating our young people in science and mathematics. Our programs can supplement and complement classroom instruction, and serve as a catalyst for families, schools and community groups to take action to help our children learn this basic subject matter.

Quality educational television offers a practical, cost-effective way to attract children to a new opportunity to learn at home, as well as to supplement and reinforce classroom teaching. Our experience also shows that educational television is a bargain -- about a penny per program per day for each viewer.

The Congress's support of our programs has made the Children's Television Workshop a major instructional educational institution with probably the largest student body in the world -- millions of children two to thirteen years old. These children mostly attend our classes voluntarily and before or after mandatory hours spent in the classroom.

Your support of our programs is adding hours to each school day, and each school year -- effectively supplementing the work of teachers and parents. Television reaches every consumer of our society, and children watch it daily -- too much, in fact. Without our programs, and others in PBS's children's block, what they will watch will be mindless entertainment at best. With your continued forceful support, this powerful medium will be used for constructive educational purposes that benefit all our children -- and ultimately the strength of our free society.

Experience has shown that educational television for children works -- and that it can only work if leadership from the Congress insists that resources be made available to allow it to do so.

Federal funding is essential to ensure the production of programs such as 3-2-1 CONTACT and SQUARE ONE TV. The National Science Foundation stands as the essential funding source for these television efforts in science and math education. With your help they can sustain and build on the progress already achieved.

The NSF's science education program merits and needs your continued support, in particular the Materials Development and

Informal Science Education Division should be increased in FY '88 at a rate commensurate with increases proposed for many other NSF departments.

Thank you.

We understand that the Subcommittee is interested in our work with the Federal Emergency Management Agency. Here is a brief report on our activities.

The Workshop's Community Education Services (CES) Division was created to develop and sustain audiences for SESAME STREET and other Workshop productions, especially among low-income families. One major focus of the Division is on using SESAME STREET as a resource for tackling issues of community concern, particularly those relating to preschoolers and their families. For the past seven years, CES has used the catalytic power of SESAME STREET and its extensive outreach experience to address important safety issues - fire safety, lead poisoning, and now natural hazards.

Currently, CES is developing a series of materials to reach and teach children and their families important safety information and facts about natural hazards - hurricanes, earthquakes, tornadoes, etc. Extensive background work has been an essential ingredient to the formation of this project as with all CTW projects and programs.

The formative research process for the natural hazards project has involved: a literature review of natural hazards materials related to children; meetings and discussions with natural hazards researchers, practitioners and child development specialists to identify opportunities and barriers to natural hazards education; an informal investigation to learn the target audience's information level about natural hazards and the sources of that information; and a seminar on children, natural hazards and the media.

The result of this planning process will be a series of family kits, using the familarity, credibility and appeal of SESAME STREET. BIG BIRD Get Ready Kits are intended to motivate families to prepare ahead for safety in the event of an emergency. In addition, guidelines materials are being developed for use by state and local emergency managers, civil emergency and public safety officers, Red Cross staff and volunteers, National Weather Service meteorologists and other organizations concerned with reaching families and communities with preparedness and safety information.

The first kit, which deals with hurricanes will be ready for distribution during this year's hurricane season. A family kit on earthquakes is nearing completion. All of the BIG BIRD Get Ready Kits are designed to complement, not replace, existing materials.

Reactions to these materials from the emergency management, natural hazards research and international disaster communities has been very positive. Presentations at national and international natural hazards and disaster meetings have generated excitement and eager anticipation for the kits, and requests from communities to serve as demonstration sites for distribution and use of the kits.

STATEMENT OF CYNTHIA H. NULL, PH.D., EXECUTIVE DIRECTOR, FEDERATION OF BEHAVIORAL, PSYCHOLOGICAL, AND COGNITIVE SCIENCES

CONSISTENT FUNDING CRITICAL

Senator LAUTENBERG. Dr. Null?

Dr. NULL. Mr. Chairman, I am Dr. Cynthia H. Null, executive director of the Federation of Behavioral, Psyhological, and Cognitive Sciences, a coalition of 13 scientific societies. Thank you for the opportunity to comment on the fiscal 1988 appropriations for the NSF.

As scientists, we are pleased with the administration's active support of federally funded basic research, as reflected in the proposed NSF 1988 budget. Consistent funding for NSF, whose sole mission is to support basic science, is now more important than ever.

NSF is an important source of funding for the behavioral and cognitive science research. Our most valuable economic resource is the human mind. The prospect of becoming more competitive a nation lies in using to the fullest the capacities of the human mind. One way is by using technology to augment human thinking; another is through research on cognitive processes, which has the potential of enhancing our own abilities.

The nation faces serious difficulties in adjusting to new information technologies in the workplace and in finding productive ways to utilize new technologies to increase the competitiveness of our industries and the quality of our educational institutions. Most of our lives have changed dramatically as we added office computers to our daily lives. Hopefully, it has changed for the better.

The results of research in behavioral and cognitive sciences are already being used to design better systems, to keep in mind the relationship between the human and the machine.

INTERDISCIPLINARY EFFORTS NEEDED

The need for strengthening our nation's educational programs in mathematics, science, and technology is broadly recognized. This means we need to improve our understanding of the processes of problem-solving, learning, and teaching. It is clear that effective science education will result only from the efforts of both the science and the educational communities. We support interdisciplinary efforts by behavioral and cognitive scientists, content area scientists, and science educators.

As with any science, research relevant to education in mathematics, science, and technology is cumulative. It requires continuing support if it is to be sustained and expand its impact in education. Continued NSF support, and increasing support, is therefore critical.

We also must encourage the participation in mathematics and science at an early age, and increase our understanding of participation and career decisions. Those students who choose not to take math and science in junior high will probably never be scientists, and sometimes those decisions are made without really thinking about careers and what careers need background in math and science.

EDUCATION AND HUMAN RESOURCES

Recognizing that the key to future science is the availability of highly trained scientists and engineers, the NSF's 1988 budget includes $273 million in education and human resources. Behavioral science research to identify factors contributing to relatively low levels of participation in mathematics and science courses by women and minorities is underway. As a nation, we must actively encourage broad participation of all parts of our society in science.

As you know, we face difficult budget decisions in the days ahead, but we caution that you not deplete tne mine of knowledge needed to keep this nation strong. Research results cannot be bought on a short time scale; neglecting basic research this year means fewer gains in subsequent years. We cannot remedy the deficit this would cause by increasing research spending at a later time.

Good research requires attracting good people to work on important problems, training new researchers, obtaining basic results, and working out their applications. None of this can be done quickly.

In conclusion, we support the fundamental research at NSF at the level of the administration's 1988 budget of $1.893 billion. We particularly would like to call the subcommittee's attention to the critical importance of research in behavioral and cognitive sciences.

Thank you.

Senator LAUTENBERG. Thank you very much, Dr. Null. We will have your full statement included in the record.

Dr. NULL. Thank you.

Senator LAUTENBERG. And we thank you for being so rapid in your presentation.

[The statement follows:]

STATEMENT OF CYNTHIA H. NULL, PH.D., ON BEHALF OF THE FEDERATION OF BEHAVIORAL, PSYCHOLOGICAL AND COGNITIVE SCIENCES

Summary: We recommend that support fundamental science research be strengthened by funding NSF at the level of the Administration's FY88 budget of $1.893 billion. We would particularly like to call to the Subcommittee's attention the critical importance of research in the behavioral and cognitive sciences. In addition, this nation must work hard to improve science and mathematics education and increase participation in science from all segments of this society through NSF programs which increase research on the teaching and learning of science and mathematics and target the development of human resources in science, engineering and technology.

Mr. Chairman and members of the Subcommittee, I am Dr. Cynthia H. Null, Executive Director of the Federation of Behavioral, Psychological and Cognitive Sciences. The Federation, established in 1980, is a coalition of 12 scientific societies with combined memberships of over 90,000. The Federation's interests include research on behavioral, psychological and cognitive processes and their physiological bases and its application to education, health and human development. Thank you for the opportunity to comment on the FY88 appropriation for the National Science Foundation (NSF).

We wholeheartedly support the Administration's proposed NSF FY88 budget. It is important to the nation to maintain a strong Federal role in basic research even as the Congress continues to take major steps to reduce the Federal deficit. Doubling the NSF budget over the next five years is not only a laudable plan but critical to our Nation's future.

Research results cannot be bought on a short time scale. Neglecting basic research this year means fewer gains in subsequent years. We will not be able to remedy this deficit by increasing research spending at that later time. Good research requires attracting good people to work on important problems, training new researchers, obtaining basic results and working out their applications. None of this can be done quickly; the investment in ideas, people, methods, and applications must be made now. That is why it is important for the government to enhance, wherever possible, its support for basic research. In addition, we must work hard to improve science and mathematics education and increase participation from all segments of this society.

In this testimony we would particularly like to call to the Subcommittee's attention the critical importance of research in the behavioral and cognitive sciences and science education. In addition, we will comment on developing human resources and broadening participation as well as science and technology centers.

Behavioral and Cognitive Sciences

Our most valuable economic resource is the human mind. The prospects of becoming more competitive as a nation lie in using to the fullest the capacities of the human mind. One way is by using technology to augment human thinking. Another is through research on cognitive processes, which has the potential of enhancing our own abilities to think, solve problems and make decisions innovatively and creatively. A few examples of how productivity can be enhanced are by effective training, optimally matching people to jobs, reducing absenteeism and turnover, and increasing motivation. Computerized adaptive testing has not only improved the testing environment (reducing administration time and cumbersome scoring techniques) but may increase the quality of ability measurements. Cognitive psychology is being used to design more effective training programs. Recent reviews of numerous attempts to improve productivity using methods based on basic psychological research indicate uniformly positive effects--reduced absenteeism or increased output.

The nation faces serious difficulties in adjusting to new information technologies in the work place and in finding productive ways to utilize new technologies to increase the competitiveness of our industries and quality of our educational institutions. Results of research in behavioral and cognitive sciences are already being used in the design of new human-machine systems, the development of programs of training and education, and the improvement of the working environment for many in our nation's work force.

Traditionally one thinks of automation in terms of job productivity (carrying out a dangerous function, handling a function where humans make excessive errors because of boredom or heavy workload, or supplementing human performance) and job availability (machines replacing humans or changing the technical level of jobs). However, automation can have another critical effect. It can substantially change the role of the supervisor of complex equipment and systems--aircraft, power plant control rooms or intensive care units. These jobs can shift from boring (when everything is running smoothly under computer control) to overwhelming (during an emergency) in brief periods of time. Technology assists in performance, but it raises a new set of issues: Should systems make their own decisions? Should they inform the operator of every action they take? Do these systems create or eliminate workload? Much of the basic research that will help answer these questions is in the areas of decision making, problem solving, memory, attention, perception and motor skills.

Continued improvement in use and development of technology requires solutions of fundamental scientific problems regarding the nature of human understanding, learning and motivation. We need to understand more about the cognitive skills and knowledge required for successful performance in technical domains. Systems must be designed taking into account the strengths and limitations of both the human operator and the technology.

We need to study how people understand technological systems in order to assure an optimal design for human use and comprehension. As we become increasingly dependent on electronic graphics for communication, scientific progress in understanding thought processes will contribute critically to the design of computer-based visual displays. Characterizations of the mental models that people use in reasoning has been the basis for the design of new technical systems as well as training programs, instruction manuals and error indicators (feedback mechanisms--lights, buzzes, error messages, etc.).

Science Education

The need for strengthening our nation's educational programs in mathematics, science and technology is broadly recognized. The March 1986 National Science Board report on undergraduate science, mathematics and engineering education cites "serious deficiencies" that are harming this country's economy and security. In addition, we are not attracting enough of our youth into courses in mathematics and science, which are absolute prerequisites for careers in science and engineering.

In turn, this means we need to improve our understanding of the processes of problem solving, comprehension, learning, teaching and testing to guide the development of new educational resources, including the effective use of new computational technology in both instruction and testing. We must also encourage participation in mathematics and science at an early age and increase our understanding of participation and career decisions.

It is clear that effective science education will result only from the efforts of both the science and education communities. We support interdisciplinary research efforts by behavioral and cognitive scientists, content area scientists, and science educators.

Research on problem solving has provided significant new information about cognitive processes and knowledge--demonstrating the kinds of knowledge required for successful problem solving and providing explicit descriptions of knowledge relevant to selected domains in science and mathematics. For example, a predominant view underlying current curriculum design and teaching in science is that students' understanding of scientific concepts is shaped by their instruction. Much care is taken to avoid presenting incorrect principles or concepts. However, students begin their study with strongly held conceptions of phenomena that are explained by scientific principles. Even young children are curious about their world--how things work as well as their classification. When children do not receive much formal science education until high school or college, misconceptions of scientific concepts are allowed to develop. Research shows that their preconceptions are often inconsistent with the principles to be learned but persist even after considerable instruction. As a consequence, students may be able to use their formal knowledge to correctly solve textbook problems but still base their understanding of events of the world on their incorrect preconceptions when taught with commonly used methods.

Many of these research findings are important for educational practice. Recent information about the sources of difficulty in understanding mathematical, scientific and technical concepts provides a basis for development of educational materials and methods for reaching a broader group of students.

Research in cognitive science is not only changing our views of how people learn science and mathematics, it is also shaping a theory of learning in which content plays a central role. The approach implies that much of the research in teaching and learning in science will be done in the context of the science being taught.

As with any science, research relevant to education in mathematics, science and technology is cumulative. It requires continuing support if it is to sustain and expand its impact in education. Continued NSF support is therefore critical.

Developing Human Resources and Broadening Participation

Recognizing that the key to future science is the availability of highly trained scientists and engineers, NSF's FY88 budget includes $273 million in education and human resources. Behavioral science research to identify factors contributing to relatively low levels of participation in mathematics and science courses by women and members of minority groups is underway and is suggesting ways in which increased participation can be developed. As a nation we must actively encourage the broadly based participation in science.

The individual decision to participate is shown to be influenced by the expected values and costs of participation and by the individual's expectation of success in pursuing the decision to participate. School policies such as course requirements, tracking and guidance practices, and admission policies may function as a final determinant that overwhelms the effect of all the complex influences determining the individual's intention or personal decision. Prior achievements and experienced difficulties are certainly important. Analyses of Project TALENT data permit us to conclude that prior achievement remains an important predictor of persistence in mathematics-related fields beyond the school and college years. Another important influence is the person's self-perceived ability to achieve in the area, which is likely to be influenced by past history.

There is a great need for research into the mathematical and scientific concepts and skills that are actually needed in a variety of life roles--whether as a common citizen, a business person, or as a scientific and technical professional. Students, teachers and the general public have little knowledge of this and the perceived need for mathematical and especially scientific education is presumably reduced by that lack of knowledge.

Sophisticated evaluation of intervention programs designed to increase science participation is needed. Despite research that suggests the importance of achievement on participation decisions, many intervention programs have focused on the presentation of role models. The processes of early interest development, in general, as well as scientific interests need exploration. Interest patterns seem to be a major determinant of participation in science, but little is known about their origin and development. It is possible that interest depends upon appropriate prior knowledge and experience. For example, females seem to have much less informal science-related experience with toys and hobbies in childhood.

Science and Technology Centers

Much federal support of research goes to individuals in the form of grants and contracts. An alternative funding mechanism is to support centers, laboratories or other forms of institutions. Good arguments can be made for the virtues of each kind of funding. For FY88, NSF is proposing to develop a centers initiative. Multidisciplinary research is increasing in importance as the questions in science become broader. We are pleased that the NSF has recognized the importance of behavioral and social science research in this initiative. Although we recognize the potential of centers and the importance of diversity of funding mechanisms, we believe the individual-investigator mechanism remains the mainstay of basic research. Individual grants are flexible, allowing rapid response to changes in the disciplines. We know that you face difficult budget decisions in the days ahead, but we would caution you not to deplete the mine of knowledge needed to keep this nation strong.

We recommend that you continue to support fundamental science research by funding NSF at the level of the Administration's FY88 budget. This is necessary if the United States is to remain a world leader and innovator and to insure building on your previous investment.

Please do not hesitate to call on the Federation staff if we can be of further assistance during your deliberations. Thank you again for the opportunity to share our views with you and this Subcommittee.

STATEMENT OF DR. ROBERTA COLMAN, PROFESSOR OF BIOCHEMISTRY, UNIVERSITY OF DELAWARE, FOR THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY

Senator LAUTENBERG. I would next like to call on Dr. Roberta Colman, Jack Dangermond, Russell Drew, and Dr. James Idol. We also have room for Mr. Marshall Cronyn, if he is here.

Thank you very much. Again, I start out with an apology for having you condense your hard work into such a short presentation; but the full statement will be in the record.

We invite you, Dr. Colman, to make your statement—again, keeping in mind that the clock is watching you. I am sorry to do that to you, but please go ahead.

Dr. COLMAN. The Federation of American Societies for Experimental Biology, FASEB, is convinced that investments in basic research at NSF and throughout the federal government is the source of new knowledge that becomes tomorrow's goods and services. These developments are crucial to improving the competitive stance of the United States in world markets, and, therefore, FASEB supports the NSF budget of $1.89 billion, and also the plan to double the NSF's budget in the next 5 years, provided the sources for this purpose are not siphoned off from other key research areas such as the National Institutes of Health.

BIOLOGY PROGRAMS SHOW GROWTH

The administration's total request includes $297 million for the Biological, Behavioral and Social Sciences Directorate [BBS], a 15-percent increase. We are pleased that all biology programs within BBS show growth, and we support particularly the emphasis on such areas as genetics and biochemistry. We also support the biological facilities center awards which provide one-time $500,000 awards to universities to upgrade their biological instrumentation.

BIOLOGICAL RESEARCH CENTERS

The proposed biological research centers could be a creative solution to funding research as well as providing a unique multidisciplinary educational and training environment for tomorrow's scientists. We urge, however, the Foundation and also this subcommittee to consider the following points:

Centers should be supported in such a way that they do not drain support from the individual investigator-initiated research grant. This is the backbone of any sound research enterprise, including NSF, as any practicing scientist knows.

Two, the subcommittee and the Foundation should carefully examine the budget implications of a proposal that could absorb substantial portions of the NSF resources for several years to come. Foundation Director Erich Bloch noted in congressional testimony that the Foundation would like to support about 70 centers in the near future, at a cost of approximately $3 million per center per year. This would be a very significant outlay for the Foundation, and, therefore, FASEB urges the subcommittee to regard biological research centers as experimental, with an initial investment in only one to two. This may allow evaluation of the center approach without compromising NSF's support of other important programs.

We are pleased to see that the administration has proposed a 10-percent increase in the Chemistry Division of the Directorate for Mathematical and Physcial Sciences. However, a larger boost, perhaps one comparable to the 15-percent boost for BBS, could be efficiently utilized. More funding for chemistry, especially for research in the chemistry of life processes, would be money very well spent, as was pointed out in the recent National Research Council report, "Opportunities in Chemistry."

SCIENCE AND ENGINEERING EDUCATION

In the area of science and engineering education [SEE], FASEB is pleased to see that the administration has requested a 16-percent increase to $115 million. We support NSF's intent to increase its spending at the graduate and undergraduate levels in order to directly help produce quality scientists. But it is also important for the Foundation to attract young people into scientific careers, and this can best be accomplished by focusing more attention on improving precollege programs in general and the teaching qualifications of the precollege science teachers in particular.

We favor the earlier NSTA recommendation that the Office of Teacher Preparation and Enhancement receive at least an $11 million increase in fiscal year 1988. This is the office which works to improve the qualifications of the precollege science teacher.

Finally——

Senator LAUTENBERG. Dr. Colman, I hate to do this to you, but we will have your full statement. Again, we agree with you so wholeheartedly. I am not supposed to do that; I am supposed to be objective here.

Thank you. We have your whole statement for the record.

Dr. COLMAN. Let me say just one more sentence. We are very supportive of the programs for supporting minorities and women, so that we can increase the representation of both of these groups in science.

Senator LAUTENBERG. I agree with that, as well.

[The statement follows:]

STATEMENT OF DR. ROBERTA COLMAN, PROFESSOR OF BIOCHEMISTRY, UNIVERSITY OF DELAWARE, ON BEHALF OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY

Mr. Chairman, members of the subcommittee, thank you for this opportunity to testify on the FY 1988 budget for the National Science Foundation. I am Roberta Colman, professor of biochemistry at the University of Delaware in Newark. I am here representing the Federation of American Societies for Experimental Biology (FASEB), a nonprofit organization whose purpose is to develop and disseminate new knowledge in the life sciences through its meetings and publications. FASEB's 28,000 members represent research, educational and clinical centers throughout the U.S. We have had 109 Nobel Laureates named from among our membership since FASEB was founded in 1912.

Investment in basic research at the Foundation and throughout the federal government produces the new knowledge that becomes tomorrow's goods and services and is crucial to improving the competitive stance of the U.S. in world markets. Therefore FASEB supports the President's FY 1988 request for NSF of $1.89 billion. We also support the Administration plan to double the NSF budget over the next five years, provided resources for this purpose are not reallocated from other key research areas such as the National Institutes of Health.

The Administration's total request includes $297 million for the Biological, Behavioral and Social Sciences Directorate (BBS), a 16 percent increase. We are pleased that all biology programs within BBS show growth and we support NSF's intent to focus BBS's efforts on areas such as genetics and biochemistry. We also support the Biological Facilities Center awards--the "minigrants" which provide one-time, $500,000 awards to universities to upgrade their biological instrumentation.

The proposed Biological Research Centers could be a creative solution to funding research as well as provide a unique multi-disciplinary educational and training environment for tomorrow's scientists. We urge, however, that the Foundation and the Subcommittee consider the following points:

- Centers should be supported in such a way that they do not drain support from the individual investigator-initiated research grant, which is the backbone of any sound research enterprise, including NSF.

- The Subcommittee and the Foundation should carefully examine the budget implications of a proposal that could absorb a substantial portion of NSF resources for several years to come. Foundation Director Erich Bloch noted in congressional testimony that the Foundation would like to support about 70 centers in FY 1988 at a cost of approximately $3 million per center. Centers would receive support for 3-4 years at an annual cost of approximately $210 million for the next several fiscal years. This would be a significant outlay for the Foundation.

- It is not clear how the centers concept will work in biology. As you know, the Foundation's six original engineering research centers, now in their third year of operation, are scheduled to undergo their first intensive evaluation this year. It is not yet evident whether the ERCs, NSF's most tangible centers experience, can be termed a success. If they are judged successful, it is still not clear how relevant the ERC model is to biology centers. For example, although financial participation by industry is a cornerstone of the centers plan, it is not known to what extent biology-oriented companies would be interested in investing in such units.

- Centers, as a significant focus for federal research funds, may over time become subject to political considerations such as siting that could outweigh merit review as the primary criteria for funding decisions. In addition, if a Biological Research Center can receive federal support for as long as 11 years, as an Engineering Research Center can, the potential exists for large numbers of centers to become permanent fixtures in the NSF budget.

FASEB therefore urges the subcommittee to regard Biological Research Centers as experimental, with an initial investment in only one or two in order to measure potential success without compromising the Foundation's ability to adequately support other programs.

We are pleased to see that the Administration has proposed a 10% increase in the Chemistry Division of the Directorate for Mathematical and Physical Sciences. However, a larger increase, perhaps one comparable to the 16% boost for BBS, could be efficiently utilized. More funding for chemistry, especially for research in the chemistry of life processes, would be money well spent, as the recent National Research Council report Opportunities in Chemistry points out.

Similarly, the proposed 10% increase in the Engineering Directorate's Division of Chemical, Biochemical and Thermal Engineering, while healthy, still lags far behind the overall planned increase of 23% for the Directorate as a whole.

In the area of Science and Engineering Education (SEE), FASEB is pleased to see that the Administration has requested a 16% increase, to $115 million. We also support NSF's intent to increase its spending at the graduate and undergraduate levels in order to maintain the pipeline which produces quality scientists.

It is also important for the Foundation to attract young people into scientific careers. According to a National Science Teachers Association analysis, most precollege programs are level-funded. The National Science Teachers Association also notes that most young people have lost their interest in science by mid-grade school. If we are going to continue to adequately fill our need for scientists, we need to attract young people to science careers in the early stages of their education. Study after study has also indicated that high school teachers play a key role in determining student career choices. Given these circumstances, it would make sense for NSF to focus more attention on improving precollege programs in general and the teaching qualifications of the precollege science teacher in particular. We second NSTA's recommendation that the Office of Teacher Preparation and Enhancement, which works to improve the qualifications of precollege science teachers, receive at least an $11 million increase in FY 1988.

One means of enhancing science teacher qualifications would be to resurrect a program comparable to the Summer Institutes program NSF supported in the 1960s and early 1970s. My own society, the American Society of Biological Chemists—a FASEB constituent society--has been supporting for four years a program which shares certain features with the Summer Institutes program. Under our High School Science Teacher Summer Fellowship program, we pay six high school biology or chemistry teachers $5,000 each to work for ten weeks during the summer doing research in the laboratory of an ASBC member located near them. Six teachers a summer is a minimal contribution when compared to the need and we are currently seeking outside support in order to expand our efforts.

Finally, something must be done to mitigate the severe under-representation of women and minorities in science. Their problems are quite different. In regard to women's programs, we support NSF's plans as explained in their fiscal 1988 budget summary. In particular, we support the Research Opportunities for Women cross-directorate program, although more than $2.7 million could probably be effectively spent. We also think the reformulation of the program, as outlined in the budget summary, is appropriate. In addition, we support the women's programs in the Science, Technology and International Affairs Directorate.

The situation regarding minorities in science is abysmal and getting worse. For the record we would like to submit an article on this topic written by ASBC staff which appeared in the FASEB Journal a few months ago. FASEB is pleased that NSF acknowledges the existence of this problem and plans to spend, by its own calculations, about $25 million to deal with it. We suggest, however, that such programs be administered through the SEE Directorate rather than through the research directorates. We also urge that scarce federal dollars for this problem be targeted at the precollege level. We think this is where it would do the most good.

Mr. Chairman, in the face of the large federal deficit and the requirements of the Gramm-Rudman-Hollings budget-balancing law, new or increased federal investments must be chosen in light of current national priorities and the greatest return for the dollar spent. The competitive posture of the U.S. is dependent on a steady flow of new knowledge as well as an adequate supply of trained people. Investments in basic research and education, such as those the President is requesting for NSF, are clearly justified.

I would be pleased to answer any questions you may have.

STATEMENT OF JACK DANGERMOND, PRESIDENT, ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE, CONSORTIUM OF SOCIAL SCIENCE ASSOCIATIONS

ENVIRONMENTAL AND GEOGRAPHIC INFORMATION

Senator LAUTENBERG. Mr. Dangermond?

Mr. DANGERMOND. Thank you, Senator.

My name is Jack Dangermond. I am director of the Environmental Systems Research Institute in California. This is probably an organization you haven't heard of. We have about 200 staff in the United States and about 100 abroad in 18 countries. My organization works on a highly technical software system, which I am very happy to say we have just recently installed in your state. Your state joins 38 other states who have this system, and 19 federal agencies, dozens of local governments, and 28 countries abroad. This is a system technology for managing environmental and geographic information.

I am here today to speak in favor of the National Science Foundation program and to support, on behalf of the Consortium for Social Science Associations, a full funding, as President Reagan has recommended, for the National Science Program.

I would particularly like to acknowledge this year's allocation for social and behavioral sciences. This is a science area that has been often neglected and it is fundamental and very important to the progress of this country.

CENTER FOR GEOGRAPHIC INFORMATION AND ANALYSIS

I want to share with you one of the three programs that we plan to conduct in this Social Science and Behavioral Program. It is called the Center for Geographic Information and Analysis. This is a new kind of center in geographic sciences; it is not for kindergarten education of geography, it is for developing new models for storing geographic data or storing our geographic reality in a computer form.

This is no little subject. Each year you and your associates spent in the order of hundreds of millions of dollars in the collection of geographic and spatial data—the Forest Service, the USGS, Defense Mapping Agency, EPA. They collect tons and tons and tons of tabular and map information which is not well organized and managed.

We have new technology being applied to this in the form of computers, supercomputers, and other kinds of computers; yet, we don't have a very good theoretical basis for how to organize this spatial data. We have no good technicians and theoreticians and scientists working on it. We know that this will require a multidisciplinary approach to bring about.

How does it affect us? It certainly affects us on efficiency of data management, its collection, and we see the redundancy—unfortunately—the redundancy in mapping and other data collection in this country and your federal agencies, with massive amounts of money being spent on collection which is redundant and inconsistent.

At the local government level, recent studies suggest that something like $3 per person is being spent on the collection of land information, and we don't have a very good sound basis for how we ought to organize it in the computers. This center would help us understand that. It would bring the kinds of theoreticians together to develop the right kind of math, the right kinds of models, to be able to organize that. It would have direct financial impact on our agencies; it would also have strategic value for you and your associates, as well as many others, because we would be able to use information strategically for planning or environmental management, or other sorts of things. We don't have the ability to do that now; manual or even electronic maps don't give us that strategic ability to manipulate and model information about geography.

So this program is very important. It is a component of the overall social and behavioral science program. We acknowledge you for taking interest in it, and we want you to give us the support in making it real.

I cannot tell you how this relatively small investment will be leveraged to impact so many of the governmental and strategic planning programs.

Thank you.

Senator LAUTENBERG. Thank you very much, Mr. Dangermond. I don't know whether you know, I am new to this body, 4 years ago. I was in the computer business before.

Mr. DANGERMOND. I know.

Senator LAUTENBERG. And I have a great interest is data collection and information processing, and I know how much information lurks in the halls of buildings without ever being assembled and used. It is a critical factor in the way we control our destiny, very frankly, in how we plan our future, especially when we talk about the environment. I am chairman of the Environmental Oversight Committee.

Mr. DANGERMOND. This is a wonderful framework for being able to manage that. Thank you.

Senator LAUTENBERG. It is nice to hear from you.

[The statement follows:]

Statement of Jack Dangermond, Director, Environmental Systems Research Institute, on Behalf of the Consortium of Social Science Associations

Mr. Chairman and Members of the Subcommittee:

My name is Jack Dangermond and I am the Director of the Environmental Systems Research Institute, a private business which specializes in geographic information systems, software and services. My educational background includes Masters' Degrees in urban planning, environmental science and landscape architecture. I am here today on behalf of the Consortium of Social Science Associations (COSSA) which represents more than 185,000 American scientists across the full range of the social and behavioral sciences disciplines. It functions as a bridge between the research world and the Washington community. A list of COSSA Members, Affiliates, and Contributors is attached.

I would like to take this opportunity to express our appreciation to the Subcommittee for its past strong support for the social and behavioral sciences at the National Science Foundation, especially during the past few years in midst of the enormous deficit problem. I am here to discuss the FY 1988 budget for the National Science Foundation and some of the issues raised by that budget.

We strongly support the proposed overall increase of 16.5% in the FY 1988 budget and the proposed doubling of the Foundation's resources by 1992. In this era of budgetary restraint, the strong commitment of the administration to invest in this nation's scientific endeavors reflects an understanding of the importance of basic research to America's future as a great nation. Reducing that commitment will decrease the nation's ability to compete. We urge the Congress to accept the full increase.

The 16.2% increase for Research and Related Activities is also welcome. We strongly urge the maintenance of that increase during the Subcommittee's deliberations. The 13% increase for the Social and Economic Division and the 12% increase for the behavioral programs of the Behavioral and Neural Sciences Division reflect continued NSF support for these programs. These increases will finally return the social and behavioral science programs to their FY 1980 levels in constant dollars.

While it is long past time for this level to be reached, it is no longer a sufficient goal. In FY 1981 President Carter's last budget for NSF requested $1.15 billion. It included $40 million for social and economic science and $39.5 million for behavioral and neural sciences. In FY 1988 the total NSF budget request is $1.89 billion. Yet the request for social and economic science programs is only $36.0 million and for behavioral science programs is only $25.8 million. Thus, while funding for NSF has increased significantly in the past eight years, the share of those funds going to social and behavioral science research has decreased. COSSA believes a long range goal should be increased funding so that 5% of the Research and Related Activities budget goes to social and behavioral science research. We believe this is a justifiable goal given the intellectual vitality and ferment in these sciences and their importance to the nation.

The release later this year of the report of the National Research Council's 10 Year Outlook Study for the social and behavioral sciences will provide a significant picture of the vitality, ferment and contributions of these disciplines. Although not meant to be a comprehensive analysis it will indicate the challenges and opportunities for researchers to develop their work in multi-disciplinary fields and activities. We believe the Subcommittee should pay close attention to this valuable document.

The emphasis on multidisciplinary activity is also reflected in the proposed FY 1988 NSF budget. The inclusion of the social and behavioral sciences in the Foundation's proposal for science and technology centers is appropriate.

The proposed National Geographic Information and Analysis Center (NGIAC) will provide greater access to the products of digital remote sensing, geographic information systems, computer cartography, and computer graphics, which will form the basis for major advances in geographical analysis, spatial statistics and expert systems. The enhanced information portrayal and decision making capacities resulting from such theoretical advances will enable society more effectively to resolve the complex environmental and social issues the nation faces now and in the future. This center will involve expertise in disciplines including: geography, information science, computer graphics, political science, remote sensing, risk analysis and many others. Commercial vendors, government agencies, and research universities will share in the services that will be provided by the NGIAC.

The Decision, Risk, and Management Science Program (DRMS) is also strengthening its efforts to encourage collaborative interdisciplinary research across the decision sciences. It too is moving to accept multi-year, multi-investigator proposals for programs of research integrating research strategies and disciplinary perspectives. Three broad problem areas are suggested for exploration: 1) risk perception, communication and management; 2) group decision making; and 3) artificial intelligence approaches to problem structuring and model building for decision support. Here too the number of disciplines involved is large: from artificial intelligence and expert systems to political science, psychology and sociology, to organization design and general systems theory.

In the behavioral sciences a major initiative in the neurobiology of learning and memory will also include increased support for multidisciplinary research teams, and the establishment of a small number of multidisciplinary research and resource centers. Greater elucidation of the neural structures and processes which underlie the phenomena of learning, memory and information utilization will be the goal of this research.

These three initiatives in geographic information, decision, risk and management science, and psychobiology are significant indications from NSF that the social and behavioral sciences are an important part of the Foundation's agenda for economic competitiveness. Full support of the NSF's budget request will allow these important research initiatives to go forward.

Concern has been raised in many places about NSF's move to encourage the development of science and technology centers, often perceived at the expense of individual investigator initiated research. COSSA is concerned as well. For many of the social and behavioral science disciplines, the individual investigator remains the key to significant basic scientific research. Yet we can agree with Dr. Harold Shapiro, President of the University of Michigan, who told your Subcommittee that NSF support of centers "is -- at the current time -- an appropriate strategy to pursue." We also agree with his comment that the "rate of expansion of NSF funding for research centers should be cautious, retain its flexibility, and be the subject of ongoing evaluation." The Subcommittee should keep a wary eye on this situation since the long term effects of support for such centers is at the present unknown.

There are other initiatives for the social and behavioral sciences in the proposed FY 1988 budget that COSSA believes further enhances the necessity to support the proposed increase for NSF. Proposed funding for methodological and research resource development in anthropology will include new emphasis on improving ethnographic research methods and on cross cultural research in this discipline. Analysis of regional databases will provide archaeologists with greater research opportunities.

In political science and economics, increased support for postdoctoral students in political economy will allow for greater study of international economic competitiveness, international trade, and the economic consequences of public sector growth. Continuing support for the three national social science databases -- the Panel Study of Income Dynamics, the General Social Survey, and the National Election Studies -- remains important providing the data necessary to evaluate the nation's economic, social and political progress. Data collection efforts on Supreme Court decision making should provide students and observers of the court with an important new and comprehensive source of information.

The 16% increase proposed for the Science and Engineering Education Directorate represents a further step in the reinvigoration of that directorate. The commitment of the Foundation to establish a coordinator of undergraduate education is an excellent idea. We also agree with NSF that providing resources for undergraduate education within the disciplines allows for the best integration of research and training for undergraduate social and behavioral scientists. We also applaud the enhanced support for graduate students through increased numbers of fellows and increased stipends that will somewhat mitigate the impact of the Tax Reform Act of 1986.

In the past we have regaled the Subcommittee with lists of significant research accomplishments by social and behavioral science researchers. You have demonstrated time and again your belief that these accomplishments are important to the scientific enterprise within the United States. We ask you to continue that support in the future by giving NSF its full FY 1988 request.

Thank you this opportunity to present our views.

National Aeronautics and Space Administration

STATEMENT OF RUSSELL C. DREW, VICE CHAIRMAN, PUBLIC AFFAIRS COUNCIL, AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES

Senator Lautenberg. Mr. Drew?

Mr. Drew. Mr. Lautenberg, it is a great pleasure to be here on behalf of the American Association of Engineering Societies. This is a group of over 13 principal engineering societies in the United States and representing over half a million engineers.

I would like to emphasize four major points today on a somewhat different topic, and that is the National Aeronautics and Space Administration budget. However, we also would be happy to join, re-echo, some of the support for the National Science Foundation and its programs and its importance to engineering, as you well know.

But we see a particularly urgent need to refocus attention on our National Aeronautics and Space programs, particularly those conducted by our civil agency—that is, NASA.

NEED FOR MORE LEADERSHIP

For many years we have felt the need for greater direction to these programs, and more of the leadership and sense of excitement that has characterized that program in times past. Many of the objectives that you talked about earlier this afternoon will be enhanced significantly by the excitement and interest in technology and in science and its achievements that come with a strong, vigorous, and productive space program.

Now, the four issues I would like to emphasize are launch vehicles, applications programs, the continuation and reinvigoration of our science programs, and finally, the extension of our technology base.

LAUNCH VEHICLES

First, launch vehicles: The need for additional capacity to supplement our space shuttle capability has been commented on extensively in the wake of the *Challenger* disaster. We would reemphasize the need to support continuing efforts by NASA which look at our long-term mix of space vehicles—the reusable shuttle, plus an expendable family of vehicles that will give us a broader mix of capabilities.

I think we were disappointed this year that NASA did not come forward with a much stronger program in that area, but we would look forward to some encouragement for them to do this in the future years.

I would like to emphasize what we felt was a need in the applications area to restore funding to a program which NASA has removed, and that is the Advanced Communications Technology Satellite Program. At a time when this nation is worried about competitiveness, to take an area where we have been particularly strong and remove an important advanced technology program in that area seems to me very shortsighted. We strongly support the restoration of funds to this program.

In science, the need for a continuing reinvigoration of this program is evidenced by the global geoscience mission, and we support the global geoscience mission as part of an important continuation of this science base upon which the other programs of NASA are going to build.

Finally, the technology-based program, the CSTI, which is intended to provide an extended base of technologies for the future programs in the agency, is an important new initiative which we strongly support. We believe the $70 million there should be funded and supported.

Thank you.

Senator LAUTENBERG. I know that ACTS has a strong role in New Jersey in the communications area, obviously.

Mr. DREW. Yes.

[The statement follows:]

STATEMENT OF RUSSELL C. DREW, VICE CHAIRMAN, PUBLIC AFFAIRS COUNCIL, AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES

My name is Russell Drew and I am Vice Chairman of the Public Affairs Council of the American Association of Engineering Societies (AAES). I am pleased to have the opportunity to present our views on the National Aeronautics and Space Administration FY 1988 Budget Request.

AAES is a multidisciplinary organization dedicated to advancing the knowledge, understanding, and practice of engineering in the public interest. Its members represent the mainstream of U.S. engineering--over half a million engineers in industry, government, and education. The member societies of AAES are:

Institute of Electrical & Electronics Engineers
American Society of Mechanical Engineers
American Society of Civil Engineers
American Institute of Chemical Engineers
American Institute of Mining, Metallurgical and Petroleum Engineers
Institute of Industrial Engineers
American Nuclear Society
American Society for Engineering Education
American Institute of Plant Engineers
Society of Women Engineers
Society of Fire Protection Engineers
National Institute of Ceramic Engineers
American Indian Science & Engineering Society

POSITION

Given the continuing pressure to reduce the federal budget, AAES supports -- at a minimum -- the funding levels proposed for the fiscal 1988 NASA budget. Even without the special $2.1 billion appropriation for the shuttle replacement, the proposed budget represents an 11.7 percent increase over the 1987 request of $8.5 billion. These added funds will serve, in part, to bolster a lagging program. However, the problems that have plagued the space program in the last few years are not simply the result of inadequate funding. Rather, they stem from a failure of leadership and management. During the past few fiscal years, most especially in 1987, AAES has been concerned at the inability of policymakers, both within and without NASA, to develop a coordinated U.S. space program. As the development of satellites, orbiters, and other space vehicles requires extraordinary scientific, engineering, and logistical planning, the failure to impose realistic goals has resulted in a faltering, disjointed space program that has lost the excitement and sense of accomplishment that inspired the American people, the U.S. aerospace industry, and our world partners and allies.

Even following the Challenger disaster, the U.S.has not moved to set national space goals. The final report of the National Commission on Space could serve as a useful starting point for the formulation of a long-range national space program, although it cannot be considered as a substitute for it. Nonetheless, its contents contrast sharply with the lack of direction reflected in the fiscal 1988 NASA budget, which appears to be a stopgap measure meant primarily to get NASA through another year of operation.

AAES recommends that Congress and the Administration place the highest priority on the development of a clear set of long-range national goals for our space program. We believe these goals should address all aspects of the space program including advanced satellite development, the construction and operation of a space station with all its attendant subsystems, unmanned space exploration, as well as scientific studies. A program based on such long-term goals would be free of the wasteful stops and starts that characterize the current space program. We have outlined such a program in our conclusion.

AAES believes that efforts to develop a coordinated and coherent space program require a commitment to long-term budgeting for specific program elements. It also requires a commitment to improve the commercial competitiveness of U.S.programs as well as a willingness to engage in discussions with other countries to ensure that the use of space is carefully regulated. The fiscal 1988 budget proposal for NASA and for other space-related activities shows little sign of clearly enunciated goals in these areas.

FUNDING

AAES has found that the failure to provide adequate long-term funding for space programs has been crippling. Efforts to redress this problem might focus on the following areas:

Space Transportation: Need for Mixed Fleet of Launch Vehicles

In the early 1980s there was considerable debate over whether to build a fifth shuttle, which eventually was rejected. In essence, the four existing shuttles were required to perform at or beyond their operational limits. The ambitious flight schedule coupled with a shortage of spare parts contributed to extensive downtime. The construction of a replacement for the Challenger will not alleviate this situation (although AAES is happy to observe that funding for the new shuttle was not taken from NASA's hard-pressed budget). Even when this new shuttle is brought into service in the early 1990s, the U.S.will still have only four orbiters.

AAES believes that a four-orbiter fleet is simply not adequate to carry out the well-balanced space program that our national interest requires. Furthermore, reliance on this undersized fleet was one of the contributory causes of the Challenger disaster and the current hiatus in the shuttle program. The damaging effects of the subsequent delay are twofold and in both cases will be long-lasting. This shutdown has cost the U.S. its preeminence in launching commercial satellites. Many of the satellites scheduled for launch by the shuttle program have been shifted to foreign rivals like the French/European Ariane program and the People's Republic of China's Long March 2 and 3 booster programs.

Secondly, this delay in the shuttle program has seriously damaged the U.S.space industry and disrupted the support system that NASA depends on to carry out its programs in an orderly manner. Many small businesses that provide equipment for university or private experiments will be unable to survive the two-year downtime, and few others will feel encouraged to assume such risks. Those large American corporations that can survive the halt in the shuttle program have broken up the engineering and scientific teams that supported the various shuttle projects and reassigned them to other products. It will be costly and time consuming to reform these teams once the shuttle program resumes.

Although the major part of the NASA budget, nearly $3.7 billion, will be devoted to the space transportation system, these funds are designed to support the shuttle recovery program and cover shuttle modifications, the Roger Commission's recommendations, and the restoration of flight operations during fiscal 1988.

AAES believes that, whereas a four orbiter fleet alone would not be adequate to handle all space transportation needs, a complementary Expendable Launch Vehicle capability would augment the fleet to the point where there would be adequate resources to maintain a healthy space program.

AAES believes NASA should have provided for an Expendable Launch Vehicle (ELV) in the fiscal 1988 budget. With a crippled shuttle program, the country cannot begin to address the backlog of military and commercial payloads projected for the next few years without ELVs.

Ideally, commercial contractors could provide the ELVs for commercial satellites, but these companies have been unable to meet this need because their development efforts have been undercut by competition from government-subsidized programs: the shuttle program in the U.S. and Ariane and Long March overseas. The Air Force has begun work to use the Delta ELV as the basis of an advanced medium launch vehicle (MLV) and has ordered twenty MLVs, twenty-three Titan IVs, and thirteen Titan IIs. The Department of Defense initiative, however, pertains only to military payloads. It is the civilian space agency's responsibility to plan and coordinate the needs of civilian commercial satellite users. Reliance on the shuttle program alone is clearly not prudent.

AAES firmly recommends that Congress encourage NASA to develop a mixed fleet of launch vehicles and plan an ELV program in conjunction with the Department of Defense and private contractors to ensure that the U.S.will meet all its launch commitments.

The Advanced Communication Technology Satellite (ACTS)

The cancellation of the Advanced Communication Technology Satellite (ACTS) in fiscal 1988 is another instance of the failure to develop clearly defined priorities to guide planning and decision making in the space program. Here, as in the shuttle program, shortsighted funding goals threaten to undermine the long-range interests of the nation.

Satellites, because of their unique technical and market features, will continue to be used for telecommunications purposes, even with increased reliance on fiber optics technology. Whether in the future these satellites and associated ground systems are U.S. or foreign depends largely on whether ACTS continues. The ACTS program was begun in August 1984 to develop the new technologies to support the communication satellite needs of the future. Current communication satellites operate in the C- and KU- bands (6/4 Gz and 14/12 Gz, respectively) where the technology has been demonstrated and is well understood. Commercial companies prefer to compete for orbit/spectrum slots in these low frequency communications bands rather than make the investment needed to develop and utilize the higher frequency bands. The goal of ACTS is to develop viable, reasonably-priced solutions to the 30/20 GZ propagation loss problems, thus opening these bands for commercial use. They would provide a communications capacity many times greater than the lower frequency bands.

The long-range advantages of such a program are clear. If the ACTS program is cancelled, this country's lead in the commercial space communications industry will be lost to foreign interests. By maintaining our lead in this area, we can preserve jobs for thousands of our citizens. It is unrealistic to expect the private sector to make the necessary and substantial investments toward developing this technology until after it has advanced to the proof-of-concept stage. AAES, therefore, recommends that the ACTS program be funded to its successful completion. This requires $75 million in fiscal 1988.

The Space Station

The United States is now on the threshold of a significant new space venture, the space station, which will provide a permanent manned presence in space for research and applications. Establishing a permanent presence in space is an essential step toward reinvigorating the U.S. civilian space program. However, given the severe budget deficit facing the federal government, the rationale for and consequences of funding an expensive enterprise such as a space station must be fully understood. We must establish definitive objectives for a balanced United States civilian space program, within which a space station would be one element. We then must provide the continuity of national commitment that will be required if we are to exploit fully such an effort for our competitive advantage.

In the absence of such clear objectives, space station planning is beginning to resemble that of the space shuttle during the seventies. Once again, cost estimates are rising and deployment dates are being pushed farther and farther back. The estimated costs have risen dramatically from the original $8 billion, and NASA Administrator James C. Fletcher now speaks of deployment in the mid-1990s, rather than in 1994 as originally planned.

The Administration is currently projecting a $12.2 billion space station cost, $10.9 billion for development and $1.3 billion for internal support. This money would provide a station comprised of a main truss, four pressurized modules, and a solar array power system. AAES believes that this cost and design configuration represent an appropriate balance in meeting our overall civilian space policy needs. We therefore urge the Congress to appropriate the full $767 million requested by NASA for space station development in fiscal year 1988.

Space Science and Applications Budget

There is only one major new start in the fiscal 1988 Space Science and Applications budget, an allocation of $25 million for the Global Geospace Science Mission. This money will provide for the development of two spacecraft to study the magnetosphere and solar winds. Their launches are planned for 1992. However, other new starts such as a comet rendezvous/asteroid flyby mission and the Advanced X-Ray Astrophysics Facility Spacebased Telescope were discarded during the budget development process.

More science missions need to be approved. The existing delays due to the shuttle coupled with the lean budgets of previous years have led to a situation where some researchers now feel fortunate if they have one mission opportunity in their professional lifetimes. This situation has been particularly severe in the planetary area.

AAES believes that NASA should allocate more substantial funding for the Space Science and Applications budget line than in the past. We believe that a more aggressive program, planned and funded according to recommendations contained in the report of the National Commission on Space, is needed. AAES particularly supports increases in the life sciences budget with the long-term goal of resuming manned space flights to the moon and beyond.

The NASA Space Applications Advisory Council (SAAC), in response to a Congressional mandate, has undertaken the development of a strategic plan for NASA's entire applications program. The upcoming report on communications is the first result of this effort. Others, dealing with remote sensing, information systems, and materials processing, are in different stages of preparation. AAES hopes that these reports will serve as useful guides in the preparation of an integrated, long-range program for applications development.

EXISTING FUNDING WHICH REFLECTS LONG-TERM PLANNING

The fiscal 1988 budget request contains several proposals which AAES strongly supports as they reflect a modicum of long-term planning on the part of the Administration and NASA. In order to be truly effective, however, funding for these activities must be continued over a period of several years.

Expanding Technology Base

AAES strongly supports the $200 million increase in NASA's research and development budget. Substantial increases have been provided for line items in Aeronautics and Space Technology, Transatmospheric Research and Technology, and Space Research and Technology. These new levels of funding incorporate a new program, the Civil Space Technology Initiative (CSTI), which has been established to develop the technology needed during the 1990s to build advanced launcher systems such as the Heavylift Launch Vehicle (HLV) and the National Aerospace Plane (NASP). Technologies such as power systems, on-orbit robotics and orbital propulsion will be researched as well as remote sensing. In fiscal 1988, $70 million has been allocated to establish CSTI. There is also a continuing NASA investment of $84 million for the NASP program, which, added to the contributions of the Department of Defense (DOD) and the Defense Advanced Research Projects Agency (DARPA), will total $325 million in fiscal 1988. AAES believes that such expenditures are well taken because they will ultimately produce a sharp reduction in the costs of space exploration. The HLV was not supported in the fiscal 1987 budget, but CSTI will provide $25 million to pursue lox-hydrocarbon propellant technology in fiscal 1988.

Efforts to Maintain Personnel and Expand Facilities

NASA has finally recognized that a growing number of its staff are approaching retirement age. Some 625 senior technical people will be added to the NASA payroll to support shuttle and space station activities. This should arrest the decline in NASA's personnel,which has dipped to sixty percent of its Apollo manpower. AAES also supports NASA's modest but important vitality package designed to keep research units functioning.

CONCLUSION

In its almost thirty-year history, the United States civilian space program has contributed to the significant improvement in our understanding of the universe and of our planet. It has led the way in the development of global communications, remote sensing, and the information processing networks. To meet the requirements of its missions, it has consistently demanded standards in electronics reliability, miniaturization, weight, cost, and versatility surpassing all previous performance specifications. Accordingly, the United States space program has been, and continues to be, a critical stimulus for science and technology.

In 1961, President Kennedy announced a definitive objective of the United States space program: the manned landing on and safe return from the moon before the end of the decade. At the time, it was not evident that this objective was possible, nor that any single nation possessed the necessary resources for its fulfillment. With the proper vision, leadership and continuity of national commitment through three consecutive Administrations, the Apollo program accomplished President Kennedy's objective on July 20, 1969.

A new national consensus on the United States goals in space is necessary. While the National Space Strategy, as approved by President Reagan on August 15, 1984, set forth many of the necessary elements of such a statement of goals, stronger leadership by the Administration and the Congress is required to build the type of national commitment that will make these elements a reality. The declaration of a set of national goals for our space program is needed to provide a clear basis for national consensus over the years to come. AAES recommends the following declaration:

> "Because of the technological and economic advantages to be derived by the nation that maintains leadership in space science, exploration, and commercialization the United States commits itself to maintaining preeminence in these fields. This will require a balanced civilian space program. In addition to replacing the shuttle orbiter and keeping the space station on schedule, the United States must allocate sufficient resources to reestablish a robust civilian space program that achieves the following goals within the next decade:
>
> 1. Expand the use of advanced applications satellites for public and commercial purposes to improve worldwide communications, navigation, and remote sensing;

2. Expand the number of scientific space missions to extend our knowledge of our planet, our solar system, and the universe;

3. Develop a mix of launch vehicles, expendable as well as reusable, to ensure greater access to orbit and to provide a broader range of payload capabilities;

4. Encourage the public and commercial use and operation of space systems and facilities;

5. Continue our exploration of the solar system;

6. Support in-space research facilities for our universities; and

7. Sponsor the early development of the advanced technology required for long-range goals. The highest priority should be given to sharply reducing the costs of building and using space systems, and to establishing human settlements on the moon and Mars."

NASA's future budgets must remain substantially higher than the FY 1988 level to provide the steady commitment necessary to achieve these goals. However, support for them will involve more than simply increasing federal funding. The barriers to private sector investments in space commercialization must be removed,a nd opportunities for international cooperation must be provided in those endeavors that are appropriate. The possibility of one day making space accessible to the general public must also be considered.

In summary, AAES believes that with appropriate budgetary support, the balanced space program outlined above will yield important benefits to the nation through --

- New public and commercial services,
- Increased scientific knowledge, and
- Advancement of the national technology base.

This balanced program will also ensure regaining United States leadership in space, a primary goal of the Space Act of 1958.

Thank you for the opportunity to present the views of the American Association of Engineering Societies on the fiscal year 1988 budget of the National Aeronautics and Space Administration.

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Dr. Drew received his Bachelor's degree in Engineering Physics from the University of Colorado in 1953 and his Ph.D.in Physics from Duke University in 1961. From 1976 to 1977, he served as the Assistant Director for National Security Affairs of the Office of Science and Technology Policy, Executive Office of the President. He was Director of the Science and Technology Policy Office at the National Science Foundation from 1973 to 1976 and was a Senior Staff Assistant in the Office of Science and Technology from 1965 to 1972. He is currently President of Viking Instruments Corporation, a small business involved with development of scientific instruments and technical consulting services.

Dr. Drew is the Vice Chairman of the Public Affairs Council of the American Association of Engineering Societies, and he is the President-Elect of the Institute of Electrical and Electronics Engineers.

ATTACHMENT A

List of AAES Societies

Member Societies

Institute of Electrical & Electronics Engineers
American Society of Mechanical Engineers
American Society of Civil Engineers
American Institute of Chemical Engineers
American Institute of Mining, Metallurgical & Petroleum Engineers
Institute of Industrial Engineers
American Nuclear Society
American Society for Engineering Education
American Institute of Plant Engineers
Society of Women Engineers
Society of Fire Protection Engineers
National Institute of Ceramic Engineers
American Indian Science & Engineering Society

Associate Societies

Tau Beta Pi Association
Illuminating Engineering Society of North America
American Council of Independent Laboratories
National Association of Corrosion Engineers
Federation of Materials Societies
National Action Council for Minorities in Engineering

Regional Societies

Western Society of Engineers
Engineering Society of Detroit
Engieering Societies of New England

ATTACHMENT B

STATEMENT OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

It is a pleasure to submit the views of the Institute of Electrical and Electronics Engineers (IEEE) on the proposed budget for the National Science Foundation (NSF), for fiscal year 1988. The IEEE is the world's largest technical professional society, with some 229,000 members in the United States alone. Our membership consists primarily of engineers and scientists in the electrical and computer disciplines, so we have a very great interest in the programs of the NSF.

Administration Proposals

Although this is necessarily a time of austere funding for Federal programs, we believe that the NSF's budget represents the "seedcorn" from which the U.S. economy can grow, by advancing our national strengths in science and technology. Thus we feel that the Administration is fully justified in proposing $205 million for Computer Science and Engineering, an increase of 23% as part of the overall plan to double the NSF budget in a five-year period. We see these requests as recognition of the key role played by computer and electrical/electronic technologies, now and in the future, in the health of the U.S. economy and our competitive posture internationally.

We fully concur with the proposal to broaden the earlier NSF initiatives on Engineering Research Centers to include Science and Technology Centers, particularly in Computer and Information Sciences and in Material Sciences and Engineering. The proposed new research programs in materials processes and interfaces, cognitive science and architecture, large scale systems engineering, and supercomputer applications are excellent choices as areas that have great potential impact on the future productivity and competitiveness of the nation.

As we have expressed in previous testimony, we recommend an approach which balances support for such centers with support for individual investigators in disciplinary programs, and thus, also balances support for basic and applied research. Thus we also strongly support the proposal to increase the average grant size to individual investigators, largely to correct the decline in real dollars for support of graduate students during the last ten years, and the equally important proposal to increase substantially the funding of Engineering Research Centers, so as to permit these exemplary units to function as originally envisioned. We would like to see further attention paid in future years to basic research in areas, such as telecommunications, which have not received significant increases to date.

IEEE Recommendations: Funding for Small Groups

With respect to the two general styles for supporting research activities, through centers on the one hand and individual investigators on the other, we recommend that a third approach between these two extremes should also be employed by the NSF. Because of the magnitude of funding necessary for research centers, very few can be funded. On the other hand, there are many engineering schools of small to medium size across the country, which taken together contribute a large fraction of the total number of engineering graduates in the United States each year. There is an urgent need to harness this important national resource, if we are to maximize U.S. industrial competitiveness. It is not feasible to operate centers at most of these schools, although many of them have first-class faculty investigators. We suggest that the NSF consider the possibility of initiating a program to support research teams which would not necessarily be either large or cross-disciplinary. Although such teams could, in principle, be supported through either the centers program or the disciplinary programs, it is in fact extremely difficult to compare small group efforts with the other categories. The review process for either of the existing categories tends to eliminate efforts involving three to five investigators. They are clearly too small to qualify as centers, and Disciplinary Program Managers tend to break small team proposals into parts for separate review, which eliminates the synergism available through group efforts.

We would also like to point out that shorter-term, goal oriented research would be one particularly fruitful way of applying such smaller group grants, which could maximize their beneficial impact on productivity in U.S. science and technology. A great deal has been said and written recently about the relatively short-term focus of U.S. industry, which contrasts sharply with the long-term focus of academia. we observe that scientists and engineers from these two critical resource groups in our country are frequently most productive when working together, sharing a focus that is long enough for the results to be competitive internationally, but short enough to give a high likelihood of productive results. Government has had the wisdom to sponsor some such efforts. The NSF Centers are an example, on a larger scale; work sponsored by the Defense Advanced Research Projects Agency (DARPA) is another. DARPA sponsors a full range of team sizes, and in many cases insists on cooperative university-industry efforts in order to bring together the best of theory and practice.

We would like to encourage the NSF to provide grants to small teams of academics, including some for the purpose of working cooperatively with industry. We believe that engineering faculty members would particularly benefit from the practical experience gained in such work. At the same time a much-needed influence would be applied to U.S. industries, drawing them toward products and manufacturing methods more advanced than their current short planning horizon allows. This approach is consistent with the forward-looking management of research funding which we associate with the NSF, and hope to see it implemented under an expanding budget for the Foundation.

ATTACHMENT C

STATEMENT OF THE TASK FORCE ON THE NATIONAL SCIENCE FOUNDTION OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

We appreciate the opportunity to submit our views on the proposed fiscal year 1988 budget of the National Science Foundation. The American Society of Mechanical Engineers (ASME) is an educational, scientific, and charitable society founded over one hundred years ago. Membership in ASME exceeds 114,000 professionals in mechanical engineering. This statement was prepared by a task force of the Council on Education of the American Society of Mechanical Engineers. It represents the considered judgement of the task force, a group of experts in the field, rather than an official position of ASME.

ASME continues its vital interest in the successful implementation of the full range of NSF programs. These comments, however, focus primarily on those aspects of the budget request affecting the contributions of engineering research to national goals.

The task force endorses the Administration's plan to double the NSF budget over the next five years. These proposed increases will help NSF balance its support for programs that foster economic vitality with those that insure the long-term health of basic research. This increased level of support can make a substantial contribution to the nation's economic well-being and national security by insuring continued U.S. pre-eminence in the world-wide market place. We are especially pleased with the Foundation's long-term commitment to ensure stability of basic research programs. We are also pleased with the continued efforts to restore support for science and engineering education which was drastically curtailed in the 1982-83 period. However, we strongly urge further strengthening of NSF basic research programs in engineering.

OVERVIEW: NSF ENGINEERING BUDGET

The FY 1988 budget request for the NSF Engineering Directorate is $205 million. This is an increase of $42 million or 25.7 percent over the current

FY 1987 plan of $163 million. These proposed increases and the plan to double the NSF engineering budget within the next five years are admirable in the face of the efforts to reduce the deficit and balance the budget. They demonstrate the Administration's commitment to basic engineering research. What justifies these increases is the key role that engineering research plays in improving the quality of life and in the ability of U.S. industry to compete effectively in international markets. Engineering research is a critical component of economic competitiveness.

The U.S. has clearly lost ground in economic competitiveness. A factor contributing to this was our neglect of engineering research during the 1970's. The U.S. is now fourth among industrialized countries behind Japan, West Germany, and France - in the fraction of gross national product invested in civilian research and development. This a further justification for increasing the NSF engineering budget in FY 1988.

In FY 1985, NSF supported a larger fraction of engineering research at universities and colleges than any other federal agency. Several engineering desciplines rely almost solely on NSF for engineering research support. In FY 1985, NSF supported 91 percent of all federally sponsored engineering research in Civil engineering and 84 percent of all federally sponsored engineering research in Chemical engineering at universities and colleges. More importantly, NSF is the only non-mission agency whose purpose is to support both basic and applied long-term engineering research across a broad spectrum of fields. The results of the research provide a basic knowledge that helps to stimulate technological innovation in the private sector, which in turn can impact U.S. competitiveness in the international marketplace.

The Engineering Division of NSF has programs in two broad areas, basic or disciplinary engineering research, and more focused or cross-disciplinary engineering research. In FY 1988, 70 percent or $29.4M of the $42M increase will be in the focused or cross-disciplinary areas of engineering research. These include the Engineering Research Centers (ERCs), an $18.5M increase or 44 percent of the total increase; the Emerging Technologies Division, a $3.7M increase or 9 percent of the total increase; the Critical Engineering Systems Division, a $3.2M increase or 7.6 percent of the total increase; and the Design, Manufacturing and Computer-Integrated Engineering Division, a $4.0M increase or 9.5 percent of the total increase.

The basic engineering programs will receive a $12.6M increase. The Chemical, Biochemical and Thermal Engineering Division is slated for an increase of $3.1M or 7 percent of the total increase; the Mechanical Structures and Materials Engineering Division, $3.6M or 8.6 percent of the total increase; and the Electrical, Communications and Systems Engineering Division, $5.9M or 14 percent of the total increase. It should be noted that even within these divisions, the largest increases are in the more focused or cross-disciplinary programs. For example, the Materials Engineering and Processing Program in the Mechanics, Structures, and Materials Engineering Division is budgeted for a $1M increase; and the Large Scale Non-Linear Systems Program in the Electrical Communications and Systems Engineering Division is budgeted for a $2.7M increase.

While it is too early to gauge all the benefits to be derived from multidisciplinary Engineering Research Centers, they have already prompted significant intellectual and financial efforts and cooperation in the academic community, as well as strong financial support from industry. We believe that many exciting projects are being developed within the ERCs which have the potential for major breakthroughs in such areas as telecommunications, robotics, biotechnology, and the development of composite materials. We believe that the current 15 authorized centers merit continued strong support, and that the number could be appropriately expanded in FY 1988 to as many as 21 centers. We, therefore, endorse the Foundation's request for an increase of $18 million in the ERC program to $48 million. We hope that the Subcommittee will give this request its fullest consideration.

In addition, we fully support the projected growth in funding levels for the cross-disciplinary programs, the Industry/University Cooperative Research Centers (IUCs) and the Presidential Young Investigator (PYI) programs. NSF resources for fundamental engineering research should continue to be managed to ensure that industry is an active partner with universities. The ERC, IUC, and PYI programs are appropriately designed to accomplish this goal. An important and potentially long lasting result is that an industrial commitment to ERCs, IUCs, or PYI encourages industry to commit a larger share of its own resources to applied research and development than might otherwise occur.

While the increases proposed address the needs of the ERCs, the emerging engineering technologies, the critical engineering systems and other more focused or cross-disciplinary programs, there is a need to establish a balance between these programs and the more traditional programs that provide funding of investigators working individually in one of the classical engineering disciplines. The need for this balance is clearly apparent in years of budget cuts. Because the increases in these traditional programs have been less than in the more cross-disciplinary programs, an across the board budget cut has a greater effect.

One way to alleviate the problem would be for the NSF Engineering Directorate to establish more formal mechanisms of interaction and cooperation between the disciplinary and cross-disciplinary programs.

We now move to comments on the specific engineering divisions at NSF.

CHEMICAL, BIOCHEMICAL, AND THERMAL ENGINEERING DIVISION

One continuing objective of the NSF in FY 1988 is "to strengthen multidisciplinary research and training in engineering at universities." In the formation of this Division as part of the NSF re-organization, new and improved symbiotic relationships were created between programs related to chemical, biochemical, and thermal processes. This is particularly true in the Division's Thermal Systems and Engineering Program, which is a merger of previous programs in heat transfer, thermal systems, and combustion. This progress continues and the 1988 budget request continues support of this initiative.

Of the five programs in the Division, the Thermal Systems and Engineering Program remains the largest and most central to mechanical engineering education and practice. Approximately 35 percent of the 3,800 mechanical engineering faculty members in U.S. universities teach and do research in the thermal systems area. Fundamental research in thermal systems impacts on virtually every industry and product - e.g., manufacturing, transportation, health care and human rehabilitation, defense systems, and the supply of energy, materials, and food. The recent Space Shuttle disaster was assessed as a thermal systems problem. The U.S. is rapidly losing still another basic industry - i.e., aluminum production - because insufficient understanding exists on how to solve the thermal systems problems - i.e., how to reduce energy required to produce the aluminum so that the total production cost is competitive with that of competitors in other countries.

Increased understanding of the behavior and operating limits of industrial thermal processes, equipment, and components relates significantly to long-term restoration of the competitive position of U.S. industry to world markets. Clearly, the requested $8.88 million for the thermal systems portion of this program in FY 1988 is very modest considering the pervasiveness of thermal processes. We also note that while this is above the 1987 current plan, it is below the 1987 budget request. This would be a major concern since heat transfer, which is part of thermal systems program, is key to most of the emerging engineering technologies. For instance, the development of techniques for very rapid cooling, more rapid than ever before believed possible in heavy manufacturing, has been the key for a novel process of connecting rod manufacture recently announced by General Motors. This process is widely considered a major breakthrough in automotive manufacturing. At the other end of the scale, heat transfer is the key to several highly desirable advances in the development of electronic devices.

It is also important to recall that increased progress in this sub-field will contribute to a reduction in energy consumption. This remains a national priority in spite of recent, and surely temporary, relief in energy pressures.

We applaud the indicated new intiatives in thermal processing; the search for new catalysts to replace the platinum group metals; the emphasis on aerosol technologies; and the emphasis on neglected areas of materials science in engineering applications. It is, however, unfortunate to note the required budget reductions in CBTE for 1987, and their subsequent impact on continuing research in these vital areas.

MECHANICS, STRUCTURES, AND MATERIALS ENGINEERING DIVISION

This division supports fundamental research on the behavior, response, and failure of materials, structures, machines, and their components. The objective is to advance the engineering methodology underlying the mechanical, structural, materials processing, manufacturing, and natural resource management and control technologies.

We are pleased to see the proposed $1 million increase in the materials engineering and processing program. This a priority for ASME. The proposed 14.5 percent increase for this division is essential to maintain the division activities at acceptable levels.

The programs within this division have the potential to have a major impact on the economic competitiveness of the U.S. For example, the Dynamic Systems and Control program can contribute substantially to the long-term restoration of America's world leadership position in the production of machines, processes, structures, vehicles, and other devices. The NSF can be a catalyst in supporting much needed fundamental and generic research in the vital area of dynamic systems and control of mechanical systems. Yet, the level of funding projected for this program in FY 1988 is considerably less than required, considering its broad scope, integrative nature and relevance to the critical mechanical and manufacturing industries of the nation. The funding level for this program should be increased at a significantly higher rate over the next several years than has been projected for FY 1988. Otherwise, the urgently needed development of new knowledge and the expansion of the manpower base in the critical field cannot be achieved.

The budget levels for the other programs in this division should also be given priority for further increases. Given that each program has to support a specified number of Presidental Young Investigator Awards, and that the Fluid Dynamics and Hydraulics program supports the largest number of PYIs in the directorate, the funds available for the support of research in some of the programs in this division have not been substantially increasing. Considering the increase in costs of supporting research, it is possible that, if these funding trends continue, the number of investigators and graduate students supported by these programs could be half of their 1984 levels by 1990.

ELECTRICAL, COMMUNICATIONS, AND SYSTEMS ENGINEERING DIVISION

This division supports research to develop an engineering knowledge base for the analysis, synthesis, design, and fabrication of materials, components, devices, systems, and phenomena that involve electrical, electronic, electromechanical, or optical technologies. In addition, the Systems/Theory and Operations Research and Large Scale Non-Linear Systems programs are responsible for developing generic principles and methodologies that support the full range of engineering systems.

We are pleased to see proposed substantial increases for some of the programs in this division, particularly for the Solid State and Micro-structures program (16.9 percent), the Instrumentation, Sensing and Measurement program (27.3 percent), and the newly formed Large Scale Non-Linear Systems program (117.4 percent).

Given the budget cuts of previous years, the other programs in this division, even with the proposed 10 percent increase, would be operating at FY 1986 levels.

There is a need to give priority to restoring these programs to acceptable levels.

DESIGN, MANUFACTURING, AND COMPUTER-INTEGRATED ENGINEERING DIVISION

We are pleased to see the proposed increased support of 28.4 percent, from $14 to $18 million for manufacturing and related research, which is a major area of emphasis in the ASME technical programs. Unlike the traditional "mature" mechanical engineering related disciplines of thermodynamics, fluid mechanics, heat transfer, and solid mechanics, the disciplines encompassed by design, manufacturing and computer engineering are only now emerging and being codified. They lack a strong science base, but such a base appears feasible. These "emerging disciplines" provide an integrating framework for the continued significance of the mature mechanical engineering disciplines. Moreover, these emerging disciplines are of vital importance to the international competitive strength of the U.S.

These emerging disciplines have been neglected within the universities so long that major new initiatives are needed to revitalize the related instruction and research programs, and to rebuild the human resource base needed. It is interesting that some university faculty members who formerly worked in the traditional engineering science areas are now migrating to these emerging disciplines. This shift is fortunate, since there will follow a better understanding of the need to focus on fundamental research issues. There appears to be a clear dichotomy between the fundamental and generic research needs that should and will be addressed through the Division's programs, and those that should be addressed by industry and other federal agencies.

In a study of "Research Needs in Mechanical Systems" conducted for the NSF by the ASME, four basic disciplines were identified as being of critical importance to the economic health of the nation: dynamic systems and control, design methodology and interactive computer graphics, machine dynamics, and tribology. In addition, a principal outcome of the study was the recognition that developing national capability in computer-integrated systems and design and implementation is the single most important issue in the field of mechanical systems. On this last point, it is concluded that a major national initiative is needed in computer integration: in design, manufacturing and operations; in intelligent products; in the computer-human interface; and in the processes of education and professional practice. It was recognized that this need goes far beyond the field of mechanical systems and is, in fact, a major national need in all engineering fields. The programs in the new division are structured to address this national need.

The ASME study of Research Needs in Mechanical Systems, and several other NSF supported studies, have had a profound influence on the new structure and mission of the Engineering Directorate. The major recommendations of the ASME study have been fully incorporated. The NSF has been responsive to input from the research community, and quite perceptive of their role in focusing on national priorities. We have recently proposed a similar study of research needs in manufacturing to assist NSF and the Department of Defense in identifying research imperatives with the greatest potential for advancing U.S. technological leadership.

The emergence of the fields of artificial intelligence and expert systems promises to provide the stimulus for greater understanding of design as a process, as well as a guide for development of fundamental axioms for design. The continued development of the tools of geometric modeling, and more generally interactive computer graphics, can potentially revolutionize the way design is done, and the way in which design results are transferred into quality and competitive manufactured products.

The programs in this division support research aimed at developing the base of scientific knowledge needed for rapid advances in design and manufacturing. Without such advances, the international competitiveness of U.S. industry will continue to erode, and more basic industries will move offshore.

EMERGING ENGINEERING TECHNOLOGIES DIVISION

The purpose of this division is to support those technological areas that show promise for enhancing, over the long-term, the national economy, employment base, and security, and for which the Nation's universities do not yet have an adequate research and human resources base. The proposed NSF budget incorporates a 23.9 percent increase in FY 1988 funding compared to the current plan for FY 1987. Particularly impressive are the increases in Biotechnology ($1 million) and the establishment of a new program in Neuro-engineering at a funding level of $2 million. The programs in Biotechnology, Bioengineering, and Neuroengineering represent in many ways a new frontier and an opportunity for the United States to maintain a position of leadership in an area that may affect very profoundly our future technological strength. The Computational engineering program of this division is an area where foreign competition is becoming stronger; the importance of this field is paramount not only from the point of view of overall technological leadership, but also from the points of view of productivity and of national defense.

We applaud the approach taken in this division, namely to add or subtract emerging areas as the need is established. We believe that it is proper for NSF to take a position of leadership in shaping the research direction of the future.

CRITICAL ENGINEERING SYSTEMS

This is a new division with most of the programs formerly in the old Emerging and Critical Engineering division. This division deals with research areas that involve large scale systems in such areas as earthquake hazard mitigation, environmental engineering, systems engineering for large structures, and material and man-made hazard mitigation.

This division has a proposed increase of 12 percent. Given that the actual FY 1987 budget is an 8.2 percent decrease over FY 1986, the proposed increase represents a modest increase for FY 1988.

CROSS DISCIPLINARY RESEARCH

This activity has gained tremendously in importance with the initiation of the NSF Engineering Research Center (ERC) program. The key role that such centers can play in fostering cross-disciplinary research was clearly defined in the report from the National Academy of Engineering that originally proposed this new approach. Since the inception of this program, 312 ERC proposals have been received from 60 percent of the graduate degree granting engineering schools, showing the strong academic interest in these activities. Even more significant is the partnership that the ERCs have with industry and state governments. These sectors have joined in support of the concept to more than double NSF's annual contribution. This strong support indicates the widely held belief that these centers will contribute significantly to American industrial productivity and international competitiveness.

ASME is firmly committed to encouraging cross-disciplinary research that provides for the involvement of industry, universities, and government. Our new Institute for Innovative Excavation Equipment and Systems, for example, will involve personnel from electrical, civil, mining, computer engineering, mechanical, industrial, and other engineering departments from universities all across the country. Researchers from these departments will work together with personnel from industrial and government laboratories on projects of mutual interest.

We endorse the proposed FY 1988 increase in the Engineering Research Center program of $18 million.

The remaining activity under the Cross-Disciplinary heading, the Industry/University Research Centers, is projected to increase from $0.5 million to $3.5 million.

CONCLUSIONS AND RECOMMENDATIONS

We support the major outlines of the FY 1988 budget for the Engineering Directorate and praise the Foundation's commitment to developing and sustaining a high level of federal support for both engineering research and education. Given the impact that engineering can have on U.S. economic competitiveness and the importance of NSF to many areas of basic and focused engineering research, we feel that it is indeed essential that Congress at least double the Foundation's budget over the next five years.

These budget increases will help NSF balance its support for programs that foster economic vitality with those that ensure the long-term health of basic engineering research. In particular, the five year plan to more than double the Engineering budget to $500 million by FY 1992 will provide the necessary funds to restore a proper balance between basic and focused engineering research.

We should point out that as ambitious as these budget increases may seem, they may not be enough. There is much catching up to do in areas that have been neglected for too long. Further, it must be recognized that the five year plan will be difficult to achieve if the Congress does not take the first step toward that goal by approving a significant increase for the FY 1988 budget of the Foundation.

It is our hope that the Subcommittee will see the budget as an important investment in the nation's economic and industrial future, the rewards of which the nation will reap many times over.

Task Force on the
National Science Foundation
FY 1988 Budget

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ATTACHMENT D

STATEMENT OF THE ENGINEERING EDUCATION AND RESEARCH POLICY COMMITTEE OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

The Engineering Education and Research Policy Committee of the American Society of Civil Engineers (ASCE), urges your support for the Administration's $1.9 billion 1988 budget request for the National Science Foundation (NSF). Understandably, concerns about the federal budget deficit may call into question NSF's proposed $270 million (17%) increase, however, the nation's commitment to enhancing U.S. competitiveness underscores the importance of preserving this budget increase.

Engineering Directorate funding would rise by $42 million (or 26%) to a level of $205 million. ASCE is particularly encouraged by increased support for Mechanics, Structures, and Materials Engineering of $3.6 million (14%) to a level of $28.5 million, and by increased funding for Critical Engineering Systems of $3.2 million (13%) to a total of $27.7 million. A substantial $18 million (56%) increase for cross-disciplinary Engineering Research Centers (ERCs) would raise the number of ERCs from 15 to 21. The ERCs expedite the transfer of research results from the lab to America's application in the global market place.

Computer and Information Science and Engineering would be boosted by $26 million (23%) to a level of $143 million. In addition, NSF's important commitment to Science and Engineering Education would rise 16 percent, to a level of $115 million. This funding will support important and expanded education efforts at the precollege, undergraduate, and graduate levels.

We commend and share the Administration's commitment to substantially increase the NSF budget over five years. Historically, technological breakthroughs have been a key factor in increasing U.S. economic competitiveness and raising the standard of living. NSF's growth in research and education activities will contribute significantly to technological development and economic growth at home, and U.S. competitiveness abroad. Given the widespread support in Congress for improving U.S. competitiveness the NSF budget should be viewed as investment in talent, and our future. This $1.9 billion budget request, though a small fraction of the Federal Government's $1 trillion budget, is a big cog in the basic research and educational activities which will ultimately fuel the economic engine of the United States. NSF support, indeed, plays a major role in the Federal funding of civil engineering research.

During the 1970's the United States lost ground in the area of economic competitiveness to several industrialized countries. This FY 1988 budget, as part of the five year plan to increase the Engineering Doctorate budget to $500 million by FY 1992, will help us to begin making up for lost ground. ASCE strongly supports the fiscal 1988 budget request for NSF and urges your approval of it.

ATTACHMENT E

STATEMENT OF ENGINEERING EDUCATION TASK FORCE

We appreciate this opportunity to share our views on the National Science Foundation budget for Fiscal Year 1988. This statement is being submitted for the record by the Engineering Education Task Force, a multi-society group working together to address major issues in engineering research and education. Member organizations are the American Society for Engineering Education (ASEE) including its Engineering Deans Council, the National Society of Professional Engineers (NSPE), and the National Association of State Universities and Land Grant Colleges (NASULGC).

ASEE is a membership society of more than 10,000 faculty, as well as schools of engineering and engineering-oriented industries. NSPE is a professional society representing 75,000 professional engineers in industry, private practice, government and education. NASULGC is a higher education association whose member colleges and universities educate more than two million of the nation's students.

The Engineering Education Task Force strongly endorses the proposed FY 1988 budget for the National Science Foundation (NSF). We believe the substantial increases proposed for engineering research and education recognize the vital role of the nation's engineering enterprise in strengthening U.S. economic competitiveness and the quality of life. It is the research achievements and education of young engineers and scientists today that will lead the nation into the high technology future of the 21st century. Our comments will focus on the education programs within the Foundation.

NSF Education Programs

Continued support for NSF precollege mathematics and science programs is important to the health of engineering and scientific research and education. Highly motivated, well-prepared students must come out of the high school pipeline or the nation will face a serious shortage of the engineering workforce necessary for the increasing needs of government, industry and academe. NSF precollege programs in recent years have helped spur a nationwide effort to improve precollege mathematics and science. They can inspire such efforts as the MATHCOUNTS program sponsored by NSPE in which seventh and eighth grade students receive coaching and participate in mathematics competitions, and the Junior Engineering Technical Society (JETS) sponsored jointly by ASEE and NSPE.

Expansion of graduate programs at NSF forms another key link in strengthening the engineering education system. Expanding the number of graduate fellowships, Presidential Young Investigator (PYI) awards, and engineering research initiation awards will help more institutions attract, keep and develop promising young engineers as graduate students and faculty members. One of the most serious problems facing schools of engineering today is the shortage of faculty: a 1985 ASEE survey showed an 8.8 percent vacancy rate in funded engineering faculty positions. The figure rises to an alarming 19 percent if one considers restoring the faculty-student ratios of the mid-1960's. There are several reasons for the faculty shortage -- including higher salaries and better research facilities in industry -- but prestigious NSF fellowships and research opportunities offer important incentives for the brightest students to consider academic engineering careers.

The Undergraduate Education Initiative

Of special significance to the engineering community is the Foundation's proposed initiative in undergraduate education. Over the past several years, NSF has maintained strong graduate education programs and since 1983, has considerably upgraded its precollege activities. But since the 1970's, undergraduate education -- the vital bridge between high school and graduate study -- has been sorely neglected at the Foundation. This new undergraduate initiative will begin to redress that unhealthy situation.

Unlike the scientific disciplines where the principal point of entry into the professions is the doctoral degree, more than two-thirds of the nation's new engineers complete their formal education with the baccalaureate degree. This makes it particularly critical that undergraduate engineering education be first-rate; most engineers do not go to graduate school to learn the technological tools and processes of their profession.

Serious Problem Areas

Partly because of its own success and because of increasing government and industry demand for engineers, the engineering education system is under severe strain. Engineering enrollments have doubled over the past 10 years at the same time that engineering schools have been experiencing serious fiscal constraints. In combination with other factors, this strain on resources has led to:

--- serious overcrowding of classrooms with resulting faculty overload, loss of morale and "burnout",

--- a severe shortage of engineering faculty, particularly in such areas as electrical and computer engineering. The ASEE 1985 survey showed an 8.8 percent vacancy rate in funded engineering faculty positions, up from 8.5 percent in 1983,

--- inability to update curricula to reflect rapidly changing technologies and engineering practice,

--- deterioration of laboratory experiences because of obsolete equipment and facilities, along with the rapid pace of change in instrumentation,

--- continuing low numbers of U.S. engineering students going on to graduate study and attainment of the PhD. The ASEE 1985 survey showed that only 59 percent of engineering graduate students were U.S. citizens; the remaining slots were filled by non-citizens,

--- reduced rate of success for engineering schools in attaining a full six year accreditation rating.

These problem areas have been well-documented in such recent reports as the National Science Board's Undergraduate Science, Mathematics and Engineering Education (NSB 86-100) and ASEE's Quality of Engineering Education.

The Role of NSF

NSF cannot be expected to address these problems singlehandedly nor to remedy the situation overnight. But what the Foundation can do is what it does best: demonstrate federal leadership in an area of national importance, serve as a catalyst for the best minds in academia to turn their attention to researching and developing solutions to the problems, and leverage resources from industry, state and local governments and academic institutions in a broadly-based, synergistic effort to address the challenge.

We believe NSF's proposed $68 million program for FY 1988 is an important step in this direction and we applaud the Foundation's foresight and commitment to substantially improving undergraduate engineering and science education.

What Can NSF Do?

Curricula Reexamination. By providing a nationally competitive, merit-based program of support, NSF can inspire major reexamination of engineering curricula including means of incorporating design, synthesis, computer integration and engineering systems into curricula, as well as finding innovative ways of making teaching more effective and efficient. This can include development of new computer softwares, creation of self-paced learning modules or new instructional technologies for face-to-face and learning at a distance.

Laboratory Redevelopment and Instrumentation. In recent years, the engineering laboratory experience for both undergraduate and graduate students has deteriorated. In conjunction with curricular redesign, the laboratory experience must be revitalized. Efforts are needed to find cost-effective ways of providing students with hands-on technical experience, including exposure to contemporary engineering practice and today's technologies.

Faculty Development. A wide variety of NSF-fostered activities could increase the attractiveness of faculty careers and contribute to the lifelong professional development of individual faculty members. The possibilities include new research opportunities not only in technical fields but in engineering teaching and learning, as well as expanded workshops, seminars, sabbatical leaves and faculty networking.

Undergraduate Research. Opportunities for promising undergraduates to experience first-hand the rewards and challenges of academic research could prove a major new incentive for students to continue on to graduate study and academic careers.

Summary

Through the Foundation's leadership, its role as a catalyst for activity, and its ability to leverage resources, we believe these programs will generate a nationwide effort to revitalize undergraduate science and engineering education. This, in turn, will help ensure the nation sustains the skilled, well-educated and flexible workforce necessary for it to remain competitive in the economic, industrial and national security spheres.

Once again, the Task Force urges you to fully support the FY 1988 budget request of the National Science Foundation. We believe the Foundation's research and education programs -- particularly the undergraduate education initiative -- represent a sound investment that will benefit the nation both now and in the decades to come.

STATEMENT OF THE AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES

I am pleased to present this statement on behalf of the American Association of Engineering Societies (AAES) regarding the engineering-related activities in the FY 1988 budget of the National Science Foundation. AAES member societies represent more than 500,000 engineers in industry, academia and government; attached to our overall statement is a list of participating societies, as well as specific statements of five of these societies on the NSF budget.

The economic health and vitality of the United States, especially in areas of international competitiveness, is a major national priority of this decade. Historically, technological breakthroughs have been a key factor in increasing U.S. economic competitiveness and raising the standard of living. The recent decline in our economic competitiveness and quality of life is not only of great concern but also points to the need for refocused attention on our technological research and educational programs. A significant increase in the resources directed toward engineering research and education will contribute directly to technological development and economic growth at home, as well as U.S. competitiveness abroad.

Engineering is the bridge from basic scientific research to useful applications that can be developed and commercialized by our nation's industries. To compete successfully against other industrial nations we must invest in basic generic engineering research to provide the infrastructure and talent that wil allow the nation to move innovative ideas rapidly into the marketplace. Experience over the past decade has clearly shown that a major reason for the success of our international competitiveness can be directly tied to the ability to move basic scientific findings rapidly into commercial applications. Substantial increases in funding for the NSF Engineering Directorate can bring about fundamental changes in the pace of our technological development, increasing our ability to compete and substantially improve our creativity through basic, cross-disciplinary and interdisciplinary research.

We strongly support the Foundation's proposed 23 percent increase in the Computer and Information Science and Engineering (CISE) Directorate budget, and applaud NSF's two-pronged initiative to support both research into the fundamental understanding of computer and information science and engineering, as well as the expansion of participation in the availability of advanced computing systems.

Continued support for NSF precollege mathematics and science programs is vital to the health of engineering research and higher education. Additionally, expansion of graduate programs at NSF forms another key link in the system. Creation of 200 additional graduate fellowships and 200 new Presidential Young Investigator awards, along with expansion of engineering initiation awards for young researchers, are the types of incentives that can help keep promising young graduate students in academe so they can become future faculty.

Of special significance to the engineering community is the Foundation's proposed initiative in undergraduate education, which is designed to improve undergraduate engineering curricula and faculty development, as well as expand educational instrumentation and undergraduate research programs. Since the 1970's, undergraduate education has barely been addressed at the Foundation; it is important that new undergraduate programs be developed to reverse this unhealthy situation.

We commend and share the Administration's commitment to substantially increase the NSF budget over five years. Historically, technological breakthroughs have been a key factor in increasing U.S. economic competitiveness and raising the standard of living. NSF's continued growth in research and education activities will contribute significantly to technological development and economic growth at home, and U.S. competitiveness abroad. Given the widespread support in Congress for improving U.S. competitiveness, the NSF budget should be viewed as investment in talent and in our future. This $1.9 billion request, including a $42 million increase in funding for the Engineering

Directorate, though a small fraction of the Federal Government's $1 trillion budget, is a big cog in the basic research and educational activities which will ultimately fuel the economic engine of the United States. Indeed, NSF support plays a major role in the Federal funding of engineering research. To assure our future position in an ever increasing technologically competitive world, substantial investments will need to be made in engineering research and education. This year's initiative is a good start in revitalizing our technological capability.

I am pleased to have this opportunity to present the views of AAES and respectfully request that this statement and attachments be included in the Subcommittee's written record of hearings on the NSF FY 88 authorization. Thank you.

NATIONAL SCIENCE FOUNDATION

STATEMENT OF DR. JAMES IDOL, COUNCIL FOR CHEMICAL RESEARCH

Senator LAUTENBERG. The next speaker, Dr. Idol, please?

Dr. IDOL. Thank you, Senator.

I am Jim Idol, former vice president, research and development, of Ashland Chemical Co., and previously research manager for Standard Oil of Ohio. It is a privilege to testify before you, sir, and I speak for the Council for Chemical Research.

The Council for Chemical Research was founded 8 years ago to strengthen interactions between the 150 universities, where nearly all U.S. academic research in chemistry and engineering is done, and the major companies which conduct most U.S. industrial chemical R&D.

Industrial support for university research in chemistry and chemical engineering increased fourfold in recent years, but private industry cannot supply the needed level of long-term research at universities of a basic nature. Federal funding of such research is key to the remarkable performance and competitiveness of our chemical industry, which translates academic discoveries into commercial practice.

VALUE OF CHEMICAL TECHNOLOGY

If competitiveness means advanced and enhanced quality and productivity, chemical technology is exceptionally valuable. Our chemical industry now contributes a net positive $7 billion to the trade balance, though less than a few years ago. Chemistry is the central science of atoms and molecules formed from them. The chemicals and allied industries employ more than 1 million people and make annual shipments aggregating $175 billion. More than 40 percent of the gross national product is directly or indirectly derived from chemistry.

Chemical science undergirds other high technologies, providing techniques and basic knowledge. The recent advances in superconductivity lean heavily on techniques in chemistry.

In tough budget times, we weigh priorities stringently. If we look at the record, the opportunities highlighted in a recent National Academy report, chemistry and chemical engineering stand out. There are new levels of chemical understanding in an arsenal of new tools, highly sophisticated instruments. Now we can explore at the molecular level problems that were previously intractable.

The Academy report singles out as especially fertile the very areas emphasized in the NSF Chemistry Division's reshaped program. But the level of funding of this Division's programs does not come near that needed to exploit the opportunities seen to bolster the economy and our competitiveness.

Nations in Europe and the Far East are seriously studying the Opportunities in Chemistry report and are making national commitments to advancing their chemical science and technology. If we fail to keep pace and expand our commitment, we risk losing our leadership in these areas as problems in steel and electronics have taught.

With vital steps, we can recapture some of this ground that we have experienced the danger of losing, and with the vital needs of the nation's future in mind, the Council for Chemical Research recommends that the Foundation's Chemistry Division budget should be increased in fiscal year 1988 to $113 million, to begin seizing new opportunities in the proven field of chemical technology; and the Foundation's budget should be augmented in fiscal year 1988 by another $10 billion above that requested for science and engineering education, a 25-percent rather than a 16-percent increase.

Mr. Chairman, thank you for the opportunity to offer testimony on this vitally important subject.

Senator LAUTENBERG. Thank you very much, Dr. Idol.

[The statement follows:]

STATEMENT OF DR. JAMES D. IDOL, COUNCIL FOR CHEMICAL RESEARCH

SUMMARY

The Council for Chemical Research was formed in 1979 to strengthen cooperation between academia and industry and to improve support for basic research, thus building U.S. competitive capability in the chemistry-based industries. Our members are the 150 universities where essentially all the U.S. academic research in chemistry and chemical engineering is done, and the major companies where most of the corresponding industrial research is done.

Among the fields of science and engineering on which this nation depends, chemistry and chemical technology are the most broadly basic, and they undergird many other sciences and technologies. They are vital to U.S. economic well-being, competitiveness and security. This is true not only in chemistry's own uses but in its influence on other fields such as biotechnology, medicine, electronics and computer technology.

The Council is pleased that the National Science Foundation is embarked on a 5-year doubling of its effort, beginning with a 10.9% increase in FY 1988.

We are concerned, though, by the lesser growth allotted to the Chemistry Division's budget. It appears not to recognize the central role of chemistry and chemical technology in maintaining -- not to mention expanding -- our competitiveness (e.g., the current annual $7-plus billion net positive balance of trade). It does not allow truly exploiting the exciting further promise identified by a recent thorough National Academy of Sciences study.

The Council also applauds the planned growth in Science and Engineering Education, because of the fundamental importance of a continued flow of well-prepared people equipped to carry forward national and local progress in science and technology. Here too, however, we are concerned that the need is greater and more important than allowed for in the budget request.

For these reasons, the Council for Chemical Research urges:

- a $10 million increment above the Foundation's request, earmarked to achieve a 20% increase in the budget of the Chemistry Division, and
- a $10 million increment above the Foundation's request, earmarked to achieve a 25% increase in the budget for Science and Engineering Education.

Mr. Chairman and Members of the Committee:

I am James Idol, former Vice President, Venture Research and Development of Ashland Chemical Company and previously Research Manager for the Standard Oil Company of Ohio. It is a privilege to testify before this distinguished Committee on behalf of the Council for Chemical Research.

THE COUNCIL FOR CHEMICAL RESEARCH

The Council for Chemical Research was founded 8 years ago. We have worked to build the academic and industrial base for U.S. competitiveness, by strengthening the interactions between academia and industry and by improving support for basic research in chemistry and chemical engineering. CCR's members are the 150 universities where nearly all the U.S. academic research in these fields is done, and the many major companies which carry out the bulk of the corresponding industrial research.

One measure of the Council's success is that industrial support for academic research in our fields has been increased by a factor of four in recent years. But private funding cannot attain anywhere near the necessary level of funding of longterm basic research in chemistry and chemical engineering, done mostly at universities. The Federal role in funding these central disciplines is a key factor in the remarkable performance of the chemical industry, which still accounts for a net positive contribution of over $7 billion to the trade balance.

INTERNATIONAL COMPETITIVENESS

"Competitiveness" has achieved buzz-word status, and properly so. It is used in different ways. One meaning is "enhanced quality and productivity."

In the light of that meaning, chemistry and chemical technology can be seen to be uniquely valuable.

Largely, this uniqueness arises from the fact that chemistry is the central science of atoms and the molecules formed from them. Atoms and molecules make up nearly all matter on earth. Chemists and chemical engineers study how molecules are made, how they are transformed into valuable new products and materials, and how they can be used safely to improve the quality of life for all humankind.

Chemistry has a central role in the economy, national well-being, and security. The Chemicals and Allied Products industry employs more than a million people and makes annual shipments totalling about $175 billion. There are more chemists in U.S. industry, contributing to its success, than all other kinds of scientist combined (not counting engineers). Some 40% of the GNP is directly or indirectly derived from chemistry (including food and energy).

Chemistry and chemical engineering also play a central role in other high technology disciplines, by providing techniques, basic knowledge and materials to fields as widely different as biotechnology, medicine, energy, and computer technology, which are themselves key arenas of the competitiveness struggle. An example: the recent astonishing advances in superconductivity depend heavily on knowledge and techniques of inorganic and physical chemistry.

NEW OPPORTUNITIES

In these tough budget times it is necessary to weigh priorities more stringently than ever. Discoveries and inventions, of course, cannot be scheduled, and the return on investment in science and engineering is never fully predictable. But if one looks at the record, and then at the opportunities spelled out in a recent Academy report[1], chemistry and chemical engineering are a standout. The experts who made that study were very impressed by the accomplishments of recent years, and the anticipated discoveries they saw on the frontiers. They faced their colleagues and bravely named priorities among their

1. "Opportunities in Chemistry," National Academy of Sciences, 1985.

subdisciplines. (That they did not call out superconductivity proves the importance of flexibility in supporting research.)

Two things turned those experts on: vastly improved levels of understanding, and the arsenal of newly available tools -- highly sophisticated instruments -- which allow us to explore at the molecular level problems that were previously intractable. Thus they singled out as especially fertile the areas of chemical kinetics, chemical theory, catalysis, materials, synthesis and analytical methods. These are the very areas emphasized in the NSF Chemistry Division's reshaped program.

The NSF's Chemistry Division is plainly working hard to balance its responsibilities: the vigor of investigations carried out by individual scientists, and participation in the Foundation-wide initiatives in computational science and engineering, improvement of the science base through human resources, and improvement of undergraduate education.

They are also wisely proposing to increase funding in the chemical underpinnings of biotechnology and the chemistry of interfaces, both areas of collaboration with other parts of the Foundation.

It is clear, however, that the level of funding of the Chemistry Division's programs does not come near allowing realistic exploiting of its valid opportunities to serve the economy and our competitiveness, either in the Foundation-wide initiatives or in the priority areas spelled out in the Academy report.

Other nations, in Europe and the Far East, are making national commitmentss to advancing the importance and uses of chemical science and technology in their industries and economies. If we fail to keep pace and to expand our commitment to chemistry in both research and education, we risk losing our leadership in these fields, as problems in steel and electronics have taught us. We have learned that the report, "Opportunities in Chemistry," is being studied very seriously in those other nations.

EDUCATION OF NEW SCIENTISTS AND ENGINEERS, AND THE PUBLIC

For this country to regain momentum at home and in the international marketplace, certain steps are essential. Two of these go together: we must improve both the funding of basic research and the flow of trained scientists and engineers.

Both of these require better education. First, improved research funding ultimately depends on a better-informed electorate. Second, an improved flow of people trained for careers in science and engineering needs updated and more attractive courses at all educational levels.

It is therefore somewhat reassuring, though we believe not adequate to the seriousness of the situation, that the Foundation proposes a 16% increase in Science and Engineering Education, since that program addresses both needs: education of students who are aiming at careers in science, engineering and mathematics, and students who are aiming in other directions.

With its influence on universities, industry and business, and its awareness of the trends in science, mathematics and engineering, the NSF is the only agency capable of effectively shaping education in these fields, all the way from early grade school years through high school, college and graduate study.

THE COUNCIL'S RECOMMENDATIONS

With the above background, having in mind the absolutely vital needs of the nation's future both early and longterm, the Council for Chemical Research strongly recommends:

- In order to seize the new opportunities offered by the proven field of chemical technology, the Foundation's budget should be augmented in FY 1988 by $10 million in order to achieve a 20% increase in funding of programs of the Chemistry Division.
- The Foundation's budget should be augmented in FY 1988 by another $10 million in order to achieve a 25% increase in Science and Engineering Education.

Mr. Chairman and Members of the Committee, we of the Council for Chemical Research thank you for this opportunity to offer testimony on this vitally important subject.

STATEMENT OF MARSHALL CRONYN, PROVOST, REED COLLEGE, ON BEHALF OF THE ASSOCIATED COLLEGES OF THE MIDWEST, THE GREAT LAKES COLLEGES ASSOCIATION, CONNECTICUT COLLEGE, REED COLLEGE, AND ROLLINS COLLEGE

UNDERGRADUATE SCIENCE EDUCATION

Senator LAUTENBERG. Mr. Cronyn?

Mr. CRONYN. Mr. Chairman, I am Marshall Cronyn, vice president, provost of Reed College, and professor of chemistry. In appearing today, I am speaking on behalf of 28 undergraduate liberal arts colleges, to express their concerns about the direction the National Science Foundation has charted for the support of undergraduate science education as it is reflected in the fiscal 1988 NSF budget.

The National Academy of Sciences journal, Issues in Science and Technology, in the winter of 1986 carried an article by Mr. Erich Bloch, Director of the National Science Foundation, in which he said:

> We need to improve undergraduate science and engineering education throughout the United States. Only a minority of our future scientists and engineers receive their undergraduate training at the major research universities. These universities tend to provide incentives and foster attitudes that value research over teaching. The undergraduate institutions which place the highest priority on teaching are hard pressed to buy increasingly expensive research instruments and facilities. Such equipment and facilities are important, however, in attracting faculty to these institutions, in keeping faculty abreast of their teaching fields, and in exposing students to the process of research.
>
> At the graduate level, we must substantially raise the number of U.S. citizens receiving doctoral degrees in the sciences and engineering, reversing a long-term downward trend. We must reduce our overdependence on foreign nationals, whose availability may be seriously affected by foreign policy changes. An adequate supply of advanced degree scientists and engineers is a national imperative and must be so recognized.

MAJOR DILEMMA IN SCIENCE EDUCATION

With these few words, Erich Bloch has provided us with a clear and concise description of a major dilemma in science education. During the decade ahead, the downward trend in the number of science Ph.D.'s and hence the number of scientists must be reversed; and yet, the values and priorities of most of our research universities place research and education of graduate students well ahead of undergraduate science education.

Mr. Bloch's commitment is good news indeed and augers well for the future of the NSF commitment to support undergraduate science; however, it is our view that this commitment will not become a reality at the NSF until and unless there are some very fundamental changes made in the way the NSF conducts its programs for the support of undergraduate science education.

That part of the NSF budget designated for undergraduate science—you will note that almost all of the increases requested are to be allocated by the research directorates and not by the Science and Engineering Education Directorate. The research directorates have been structured and staffed from advisory committees to peer reviewers by individuals from the research university sector and characterized by Mr.

Bloch as having attitudes that value research over teaching. This is not meant as a criticism of either the research university or the NSF. The major function of both in our society has been the creation and maintenance of a strong national research effort. As their highest priority, they have pursued this goal to the exclusion of the concerns for undergraduate science education.

The staffs of the research directorates cannot be expected to become effective in the design and implementation of programs supporting undergraduate science education, since they have had very little or no prior professional experience in this area.

BIASES IN U.S. EDUCATION

Until there is a clear and unequivocal voice and representation in the NSF of those whose first priority has been a professional commitment to undergraduate science education, the best efforts of the NSF in this area will continue to reflect the biases inherent in the research university sector of U.S. education.

Please note the appendix B in the document that I have submitted.

We urge that you assure the expenditure of no less than NSF has proposed to improve undergraduate science education, including the amounts that NSF now declares will depend on proposal pool, and that primary responsibility for these undergraduate science education programs should be assigned to NSF's promised new office of undergraduate science and engineering education.

Thank you for the opportunity to appear here.

Senator LAUTENBERG. Thank you very much, Mr. Cronyn. Once again, the subjects are of great interest, and every one of your presentations is one I would like to have a chance to review at some length, but we have our credit calendar. We excuse you. Thank you very much for your testimony.

[The statement follows:]

STATEMENT OF MARSHALL W. CRONYN, VICE PRESIDENT/PROVOST AND PROFESSOR OF CHEMISTRY, REED COLLEGE, ON BEHALF OF THE ASSOCIATED COLLEGES OF THE MIDWEST, THE GREAT LAKES COLLEGES ASSOCIATION, CONNECTICUT COLLEGE, REED COLLEGE, AND ROLLINS COLLEGE

Senator Proxmire and Members of the Subcommittee:

I am Marshall Cronyn, Vice-President/Provost of Reed College and Professor of Chemistry. I greatly appreciate your invitation to have me testify on that part of the budget for the National Science Foundation which supports undergraduate science education. In appearing today, I am speaking on behalf of twenty-eight undergraduate liberal arts colleges[1] to express their concerns about the direction the National Science Foundation has charted for the support of undergraduate science education as it is reflected in the fiscal 1988 NSF budget request.

The observations I am about to make are based on forty-three years of professional experience in teaching, research and college administration. In addition to my work at Reed, I have had research and teaching experience at the University of Michigan, the University of California at Berkeley, the University of Washington and Cambridge University in England. From 1961 to 1966, I served on a Medicinal Chemistry review panel which evaluated research proposals for funding by the National Institutes of Health. I have also served on a number of review panels for National Science Foundation programs in support of undergraduate science education. Most recently, I served on a panel which met to evaluate the Research in Undergraduate Institutions (RUI) program of the NSF at the end of its first year.

The enabling legislation for the National Science Foundation provided it with a mandate to support the most promising scientific research, while at the same time assuring the continuity of a strong national research effort by strengthening the science education at all levels.

In the first decades of the life of the National Science Foundation the commitment of the Foundation to science education was clear and unequivocal. On a bar graph of Foundation expenditures, it was possible to see clearly the proportion of the budget going for educational support; however, over many years that budgetary commitment faded away until the ultimate demise of the Science Education Directorate in 1982. At that point it required a rather fine pen to scale the budget commitment for science education against the total NSF budget expenditures.

Developments of the past two or three years have given us renewed hope that the National Science Foundation has at last reread its original mandate and recognized the importance of support for science education to the future strength of the nation's scientific effort. A couple of very modest steps have been taken. The Congress initiated the College Science Instrumentation Program to support the purchase of scientific instruments desperately needed to improve undergraduate education, and some of the research grant application difficulties experienced by faculty in undergraduate institutions have been addressed in the RUI program.

As welcome as these efforts have been, they have barely touched the surface of the problem, which was clearly spelled out in a report to the National Science Board by its Task Committee on Undergraduate Science and Engineering Education, the "Neal Report," published in March of 1986.[2] The main problems found by this Task Committee were the deterioration of the quality of undergraduate science and engineering education and the dangerous decline in numbers of U.S. scientists and engineers.

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[1] This group includes the members of Great Lakes Colleges Association (DePauw, Earlham and Wabash in Indiana; Albion, Hope and Kalamazoo in Michigan; and Antioch, Denison, Kenyon, Oberlin, Ohio Wesleyan and the College of Wooster in Ohio), the members of the Associated Colleges of the Midwest (Colorado College; Knox, Lake Forest and Monmouth in Illinois; Coe, Cornell and Grinnell in Iowa; Carleton, Macalester and St. Olaf in Minnesota; and Beloit, Lawrence and Ripon in Wisconsin), Connecticut College, Reed College in Oregon and Rollins College in Florida.

2/Neal, Homer A., for the National Science Board, Undergraduate Science, Mathematics and Engineering Education: Role for the National Science Foundation and Recommendations for Action by Other Sectors to Strengthen Collegiate Education and Pursue Excellence in the Next Generation of U.S. Leadership in Science and Technology (Washington, D.C.: Government Printing Office, March, 1986).

Recently we have heard from NSF Director Erich Bloch of his strong commitment to the support of undergraduate science. Mr. Bloch's commitment is good news indeed and augers well for the future of the NSF commitment to support undergraduate science; however, it is our view that this commitment will not become a reality at the NSF until and unless there are some very fundamental changes made in the way the NSF conducts its programs for the support of undergraduate science education. To those of us whose lifetime professional commitment has been to undergraduate science education, the changes needed have been obvious for years. A preliminary study of NSF precollege and undergraduate science education support in the post-Sputnik years for the Office of Technology Assessment demonstrates a remarkable consistency in the effect of increased NSF funding for science education on increased numbers of science and engineering Ph.D.'s in the succeeding years. In this unpublished study, Betty Vetter has tracked a definite bulge in the numbers of science and engineering Ph.D.'s as generations of precollege students and undergraduates benefitted from the increased NSF dollars invested in science education. If we are observing shortages in the supply of scientists and engineers now, we can borrow from NSF's past a proven cure.

The 1988 budget proposal you have before you confirms and emphasizes our concerns. Before pointing to those features of this budget which are most revealing of a basic problem within the NSF, I should say something about the nature of higher education -- about the nature of colleges and universities and their functions in our society.

The typical university in this country has a triple role to play: (1) through research and scholarship its faculty adds to the total store of knowledge and understanding in all aspects of our intellectual universe, (2) the faculty engaged in the research and scholarship are also engaged in the professional education of succeeding generations of graduate students, some of whom will follow in their mentors' footsteps, while others are prepared for roles in our society which require a level of professional competence greater than that afforded by a bachelor's level of education, and (3) the university faculty is responsible for the education of its undergraduate students up to the level of the bachelor's degree.

There cannot be the slightest doubt that any one of these three tasks might well take the total time, energy and attention of any one person. Priorities must be set and for university faculty the order of priority is research and graduate education followed by undergraduate instruction. The university itself, with always limited resources, must set priorities and does so in this same order.

Lest my listeners read into this description a criticism, I want to make it quite clear that what I am saying is descriptive and understandable given the competing demands our society places on the university. Of course, there are exceptional institutions and exceptional individuals.

The U.S. system of higher education is diverse in the extreme. In addition to the doctoral degree-granting universities, some 120, there are colleges whose mission is the education of undergraduates up to the level of the bachelor's or master's degree. There are over 800 of these institutions. Some, such as the group I represent, are private liberal arts colleges; others are state-supported institutions.

The main mission of these institutions in our society is to provide education to the bachelor's degree level. Unlike the university, there is not a competing demand that the college provide research and scholarship. Its resources are expended to obtain the best possible undergraduate education for its clientele. Colleges serve a very wide range of student clientele. For many of these students, and for some colleges, the most effective undergraduate education can only be provided by faculty who are themselves productive professional scholars and scientists. Faculty in these colleges face the same dilemma as the university faculty but with only two of these goals competing for their time and energy: research and the teaching of undergraduates. However, for the faculty in undergraduate colleges the order of priorities must be reversed with the teaching of undergraduates requiring their highest priority. Research and scholarship are absolutely essential aspects of their teaching. In all of the liberal arts colleges I represent the student experience in scientific research is not separate from but an integral part of their education. Without a faculty actively engaged in research and without an opportunity for participation in that research by undergraduates, these students would miss an opportunity for the full development of their intellect.

If one function of the NSF efforts to support undergraduate education is to assure the future supply of those individuals needed to maintain a strong research establishment, then we should ask which institutions are most effective in the education of such individuals. I call your attention to Carol Fuller's research on baccalaureate origins of Ph.D.'s (see Appendix A), which provides us with the percent of students who received their bachelors degrees from various colleges and universities who then went on to receive a doctoral degree in the sciences and in other fields.

To put these figures into more human terms: those institutions whose students proceed on to further professional education are doing two things well. In the sciences, they are preparing their students to be successful in more advanced work, but more importantly they have generated, or kept alive, their students' interest and enthusiasm for science to such a degree that their graduates in high proportions have the desire to continue in a professional career in science.

This brings me back to the National Science Foundation budget proposal and what it says about the dilemma within the NSF about support of undergraduate science education. The problem with the NSF and its proposed support of undergraduate science education is simply this: with very few exceptions all of the policies, all of the operations of the NSF are determined by individuals whose order of priorities is identical with that of the university faculty -- research, graduate education and undergraduate education in that order. Again, I do not mean this as a criticism of those priorities which follow from one of the primary missions of the NSF, which is to support scientific research. Advisory panels, NSF staff and peer reviewers nearly always come from universities and many staff on rotating appointments will return to universities. We cannot expect that such individuals will have a clear understanding of that part of the higher education system which has a different set of priorities. In my view these are basic and irreconcilable differences that should be recognized by the NSF with appropriate structural arrangements.

It is quite clear, for example, that the individuals responsible for the development of the guidelines for the Research Experiences for Undergraduates (REU) program believe that bigger is better. Those guidelines require that undergraduates be collected into "centers," which we fear will mean large institutions. They do not make it possible for a small number of students to work with a small number of faculty, as did the long abandoned but extremely productive Undergraduate Research Participation (URP) program. I doubt that even one faculty member in the most productive college in the country (see Appendix A again) was consulted before those guidelines were promulgated.

Notice that almost all of the funds to be used for the improvement of undergraduate education are to be controlled by the "Research Directorates" or by "Cross-Directorate Activities." These directorates know little or nothing about undergraduate education; they were not designed or staffed to do anything but support research and graduate assistance.

I notice that the NSF does not seem to be able to write a clear budget statement. In Appendix B, we summarize this request as NSF has presented it on different occasions. We do not quarrel with this request if it is a stage in attaining for fiscal 1989 the $100.0 million in new funds recommended for undergraduate science education in the Neal Report. But we feel that we need help, as does the Congress we suspect, in locating and understanding the programs to be funded in this budget. For several of these programs designed to support undergraduate education we see the phrase "planning estimate. Final distribution will depend on proposal pool." The NSF manages to be far more specific about other parts of its budget. I suggest that they simply have no way of spelling out programs and budgets in support of undergraduate science education because they have no one within the Research Directorates well enough informed about science education to oversee such programs. Individuals with university research priorities cannot be expected to comprehend those features of undergraduate science education which make it most effective and most productive of the very individuals who are to become the next generation of research scientists.

In conclusion, it is with mixed feelings that we view the 1988 budget proposal of the NSF. There appears to be a substantial increase in the financial commitment to support undergraduate science and engineering; however, until there is clear and unequivocal voice and representation in the NSF of those whose first priority has been a professional commitment to undergraduate science education, the best efforts of the NSF in this area will continue to reflect the biases inherent in the university sector of U.S. education. We urge that you assure the expenditure of no less than NSF has proposed to improve undergraduate science education. In the short run, this will increase the number of scientists and engineers in this country. Continued funding of undergraduate science education will keep the supply adequate in the long run.

I thank you for the opportunity to make these remarks.

APPENDIX I

Leading Undergraduate Sources of Ph.D.'s in All Fields,
Adjusted for Institutional Size
(underlining highlights non-Ph.D.-granting institutions)

Rank	Institution	All Fields Total	All Fields Ratio
1	Harvey Mudd (CA)	257	40.7
2	California Institute of Technology	1818	40.0
3	Reed (OR)	968	25.3
4	Chicago (IL)	3805	24.4
5	Massachusetts Institute of Technology	5438	21.1
6	Swarthmore (PA)	1418	20.9
7	Haverford (PA)	683	18.8
8	Oberlin (OH)	2321	17.8
9	Harvard (MA)	5554	16.2
10	New College of the University of South Florida	63	15.3
11	University of California-San Diego	362	13.9
12	Amherst (MA)	1118	13.7
	Carleton (MN)	993	13.7
	Cooper Union (NY)	602	13.7
	Pomona (CA)	1066	13.7
16	Rice (TX)	1501	13.6
17	Brandeis (MA)	893	13.5
18	Eckerd (FL)	119	13.1
19	Wabash (IN)	501	12.9
20	Bryn Mawr (PA)	593	12.7
21	Webb Institute of Naval Architecture (NY)	52	12.4
	Wesleyan (CT)	877	12.4
23	Princeton (NJ)	271[illegible]	11.7
24	Grinnell (IA)	70[illegible]	11.6
25	Radcliffe (MA)	92[illegible]	11.3

Source: Carol H. Fuller, Great Lakes Colleges Association

Note: Data reported here are based on an examination of productivity for all accredited institutions for Ph.D.'s earned during the years 1951-1980. Productivity ratios were computed by dividing the average number of Ph.D.'s conferred per year (1951-1980) by the average number of bachelors degrees conferred per year (1951-1976) for each institution.

Appendix B.

National Science Foundation Support
for Undergraduate Science, Fiscal Years 1987 and 1988

	Fiscal 1987 Current Plan ($ millions)	Fiscal 1988 NSF Request ($ millions)	1988 Plan from Bloch 4/9 Testimony ($ millions)
Support through Science and Engineering Education Directorate (SEE)			
College Science Instrumentation Program (CSIP)	9.5	9.5	?
"Faculty development" (New)	0	?	?
Total in SEE	9.5	?	?
Support through Research Directorates			
Undergraduate curriculum improvement (New)	0	?	7.0
Calculus (New)	0	?	?
Engineering (New)	0	5.0	?
Research in Undergraduate Institutions (RUI)*	9.5	?* (see PUI note below)	10.0
Research Opportunity Awards (ROA)*	1.5	?* (see PUI note below)	?
"Cross-Directorate undergraduate activities," including:	9.0	40.0+	?
Research Experiences for Undergraduates (REU)	(9.0)	?	18.0#
Undergraduate faculty enhancement (new)	0	?	11.0#
Laboratory instrumentation and curriculum development (new)	0	?	22.0#
Total(?) in Research Directorates	20.0	?	?
GRAND(?) TOTAL	29.5	"almost 70.0"*	68.0

*It is not clear whether this total for 1988 includes the RUI or ROA programs, which are mentioned separately in the budget document only as a subset under Predominantly Undergraduate Institutions (PUI) for which NSF requested [illegible] million but without breakout by program category. The broad PUI category encompasses research funding for all institutions that have awarded twenty or fewer Ph.D. degrees in fields supported by NSF in the past two years.

#"Planning estimates. Final distribution will depend on proposal pool."

STATEMENT OF DR. V. RAMA MURTHY, VICE PROVOST AND ASSOCIATE VICE PRESIDENT FOR ACADEMIC AFFAIRS, UNIVERSITY OF MINNESOTA

SUPERCOMPUTING PROGRAM

Senator LAUTENBERG. We invite Dr. Rama Murthy, Dr. Muller, Dr. Petersdorf, and Dr. Harmon, and Mr. Maher, Mr. Larson, and Mr. Block, the president of ESA to join us.

We ask you, Dr. Rama Murthy, if you would please lead off. Again, under the unpleasant constraints of time, we ask you to summarize your statement. The full statement that you have presented, of course, will be in the record, and will be there as a reference point for those interested, especially for the budgeteers and for the National Science Foundation people who I know appreciate the support of each one of you who is testifying here this day.

Dr. Murthy, please proceed.

Dr. MURTHY. Mr. Chairman, thank you very much. It is an opportunity that I cherish to appear before your committee.

I am Rama Murthy, vice provost for academic affairs of the University of Minnesota. Since my written report is already a part of the record, I will simply make a few comments concerning the supercomputing program of the National Science Foundation.

As you probably know, the University of Minnesota, in collaboration with the state and the public industry there, has taken a pioneering lead in establishing first-rate facilities in supercomputing in this country even before the national program got started. We perceived the need in the scientific community for this activity, and we have strongly supported it in the past.

We commend the National Science Foundation program in this area extremely much. I think we have done a great deal in a very rapid time—in a short time, indeed. However, I think because of the pioneering efforts made by universities such as ours, the need for supercomputing in the country has multiplied enormously, something we had not foreseen before—so much so that I think the present program is grossly underfunded, and in some senses, even, its priorities are not meeting the congressional mandate with which the program got started.

Let me recount you that recently over 300 scientists from 98 universities who use the most advanced facilities at the University of Minnesota have been asked to go elsewhere. I think this is a serious disruption for scientific work in the country, and it certainly would not be in consonance with the congressional mandate in establishing this program.

SEVENTH GENERATION COMPUTERS

I will simply recommend to you that we grossly increase the program that is currently under NSF's jurisdiction. In particular, I think we should make an effort to include facilities that are not just the phase II facilities of the National Science Foundation program but other facilities as well, and particularly those are leading edge forefront technology centers. I refer, of course, to facilities that have the current seventh generation computers such as the CRAY II and the ETA. These are the real supercomputers today.

In addition to that, I think we should also make a commitment to create a specially earmarked program in the National Science Foundation which has the effect of supporting these leading edge technologies whenever and wherever they emerge. We suspect that the collaboration between industry and the universities will lead to this situation. Today they are the seventh generation computers, but tomorrow, undoubtedly, they will be the eighth generation computers. When such instruments appear, I think NSF should take the lead in maintaining those facilities and giving it just the starting push that is needed to get programs established in this country.

Thank you very much, Mr. Chairman. I will be happy to answer any questions.

Senator LAUTENBERG. Thank you very much, Dr. Rama Murthy.

[The statement follows:]

STATEMENT OF DR. V. RAMA MURTHY, VICE PROVOST AND ASSOCIATE VICE PRESIDENT FOR ACADEMIC AFFAIRS, UNIVERSITY OF MINNESOTA

Mr. Chairman and Members of the Committee:

I am V. Rama Murthy, Vice Provost of the University of Minnesota. I am privileged to have this opportunity to appear before the Appropriations Subcommittee on HUD and Independent Agencies during its hearings on Advanced Scientific Computing at the National Science Foundation. I am here today to discuss my University's view of the needs and priorities in the supercomputing program under the direction of the NSF. In order that I do this in a logical context, allow me to review a brief history of the current national program administered by the Division of Advanced Scientific Computing at the National Science Foundation.

I. A review of the current program

Recognizing the importance of advanced scientific computing to national goals, and consistent with the recommendations of studies such as the LAX Committee Report on "Large Scale Computing in Science and Engineering" (1982), the FCCSET report on "Recommended Government Actions to Retain U.S. Leadership in Supercomputers" (1983), and the Bardon Report for the National Science Foundation entitled "A National Environment for Academic Research" (1983), Congress responded very quickly to issue a mandate to NSF to establish a program which provided for the immediate and long range needs of advanced computing services to the American research community. Use of the latest supercomputer developments was to be provided in a way that effectively complemented not only science but the nation's interest in its supercomputing industry as well.

In 1984 you did support this program in a way which even exceeded the original budget request of NSF. As a result, a very successful supercomputing initiative was started in late 1983 (FY84) to provide supercomputing resources to researchers across the nation. The University of Minnesota (CRAY-1), Purdue University (CYBER 205) and Boeing Computing Services (CRAY-1) were the three original NSF Supercomputing Resource Centers. The inaugural computing activity of the NSF program was accomplished on the CRAY-1 at the Minnesota center in July of 1984.

The NSF program activity evolved rapidly in 1985 and three more resource centers were added to address a growing demand. These centers were Colorado State (CYBER 205), AT&T Bell Laboratories (CRAY-1) and Digital Productions (CRAY X-MP). Also in 1985, selection was announced of initially four, and eventually a fifth, "Advanced Scientific Computing Centers". The chosen sites for these centers -- Cornell University (IBM 3090), Princeton University (CYBER 205), the University of Illinois (CRAY X-MP), the University of California at San Diego (CRAY X-MP) and a shared site between University of Pittsburgh and Carnegie-Mellon (CRAY X-MP) -- began operation to users in 1986. In this same timeframe the "Resource Centers" designation was changed to Phase 1 centers and the "Advanced Scientific Computing Centers" became known as Phase 2 centers.

In order to meet growing demand, NSF announced in 1986 a solicitation for additional resources with capabilities at least equivalently powerful to those found at the Phase 2 centers. The NSF plan was to extend some Phase 1 center activity through 1987 with centers able to provide resources not sufficiently available at the five national centers. The University of Minnesota submitted a proposal which was favorably reviewed by the NSF's Technical Review Group. Subsequently, a Site Visit team from the Foundation also gave our Supercomputer Center very high marks and recommended that our CRAY-2 program be funded and continued. However, fiscal difficulties caused this plan to become only partially implemented. One million dollars was made available for CRAY-2 time at Minnesota. This allocation was quickly used up by user demand and Minnesota, the last active Phase 1 center, was shut down to NSF users several weeks ago.

II. Advanced Scientific Computing needs and concerns of the academic community

I am sure this committee is well aware of the increasingly important role of the supercomputer and advanced scientific computing in support of the primacy of the nation's research enterprise. Use of the supercomputer has now become fundamental to discovery and innovation in many facets of science, engineering and technology, and is an essential resource in overcoming the challenge of our declining competitiveness in a world market. As Mr. Erich Bloch, Director of the National Science Foundation, has stated, "It has become clear that strengthening our research base to meet that challenge will depend in a large part on access to supercomputers by our scientists and engineers."

The importance of supercomputing in science, engineering and medicine was recognized early by the University of Minnesota. In 1981 we were the first university in the nation and the world to install a Class VI generation supercomputer, a CRAY-1, and later in 1985, with the installation of a CRAY-2, became the first university to have access to a class VII generation supercomputer. It was clearly understood by us then, and we believe even more strongly today, that supercomputers are a gating technology to scientific progress. It is also clear that the supercomputer capacity, both in terms of the computer speed and memory size, is a key determinant for progress in science and technology. The LAX report noted in 1982 that "the capacity of today's supercomputers is several orders of magnitude too small for problems of current urgency in science, engineering and technology." This statement remains true today in spite of major advancements in supercomputer technology. The problem of adequate capacity to handle various scientific investigations is further compounded because of the inability of our national program to utilize the most advanced and leading-edge supercomputing technology available today. I speak, of course, of the CRAY-2 at the University of Minnesota, installed and operated for the past two years with the strong support of the State of Minnesota, the industry and the University, with the encouragement of the NSF. An exciting opportunity to facilitate and enhance the scientific productivity of more than 300 scientists using the capacity of the foremost supercomputer of the day has recently been lost. A letter dated February 11, 1987, from the National Science Foundation necessitated us to terminate their access to the only existing university-based CRAY-2 in the nation.

Prior to the NSF supercomputing program, the science community was suffering from a national embarrassment of woefully inadequate access to supercomputers and equally limited experience in using them. In fact, this lack of access had resulted in the awkward situation of a few American scientists seeking and gaining access to supercomputers in Germany. These difficulties were ameliorated by the NSF program in 1984 which was managed both quickly and efficiently. However, as the program has successfully continued, the need for large-scale computing capacity has exploded as more researchers in an increasing diversity of disciplines have gained supercomputing experience. This was clearly foreseen in 1984 by the then Director of the NSF, Dr. Knapp. As we look at the scientific demand in 1987, access to supercomputing resources has again become inadequate. We know, for example, there is a great need for CRAY-2 access by the scientific community. This demand has occurred in spite of this system's non grata status in the NSF program. At present, the need of the scientific community, as expressed by the time granted by NSF to its users, is approximately 8,000 hours. A large part of this need remains unsatisfied at present. Recognizing this problem, Minnesota put forth a proposal to NSF with a goal to provide a substantial fraction of this user need. Specifically, NSF was offered an arrangement to acquire CRAY-2 time on a better than 3 for 1 basis from contributions by Cray Research Corporation and the University. In other words, for every dollar invested by NSF, they would receive more than three dollars of CRAY-2 time. The amount of the NSF funding proposed was $500,000. Unfortunately, since the NSF has been unable to act on this proposal, NSF accounts on the Minnesota system, from 98 universities around the country, have been shut down. And, the University will have to absorb approximately $1,250,000 of computer time already used by NSF researchers who needed access to complete research in progress after previous NSF funds had run out.

We also believe that the NSF program has stopped short of taking sufficient advantage of available state-of-the-art excellence. A supercomputer is defined as a system which has the largest memory and the fastest central processing speed available commercially. By such definition, the preeminent supercomputer today is uniquely the CRAY-2. This does not mean that CRAY-2 should or even could be the choice of every supercomputer center. The very limited support given in the NSF program to make the CRAY-2 accessible to scientists would suggest, however, that the country's best foot is not fully put forward.

When we first proposed a CRAY-2 to the NSF under a Phase 2 center solicitation, we were told it was too risky a technology for science. Several foreign universities have disagreed and have leaped ahead to take advantage of the cutting edge of technology. The University of Stuttgart and a French university consortium at Ecole Polytechnique both installed CRAY-2 systems in 1986. What is particularly interesting, if not frustrating, is that United States researchers faced with a shortage of CRAY-2 time here are once again being offered supercomputing time overseas. Thus, a matter of considerable concern expressed in the LAX Committee and the FCCSET reports -- the necessity for American scientists to go abroad to do their science -- is about to reoccur.

Furthermore, the net addition of NSF funded supercomputer centers is too small. Certainly there are fewer number of centers than the ten recommended in the 1983 Bardon Report. During the Phase 1 program there were three university-based centers providing national access. While five new Phase 2 centers have been established, the Phase 1 centers have been eliminated resulting in a net addition of only two supercomputer centers providing national access. It is not surprising that the Phase 2 centers are already at or near their capacity.

Because supercomputers are so important to the national interests of competitiveness and defense, the health of this country's supercomputing industry is concomitantly of vital interest. While America has always maintained world leadership in supercomputer technology, the industry is engaged in a most intense competition from abroad. Japan in particular is determined to become a world leader in supercomputers and has made notable gains towards this end in the last few years. A FCCSET committee report on recommended government actions to retain U.S. leadership in supercomputers noted: "The United States should not relinquish its lead in this important area of technology. However, a 'business as usual' approach on the part of both the vendors and the government has a low probability of competing successfully with foreign joint government/industrial collaborations."

We must aggressively advance technology's leading edge as our national priority. The installation of new supercomputer systems of substantially increased capability and capacity is an essential first step. At present this means support of Class VII supercomputers (CRAY-2 and ETA-10 are commercially available) as apart from more contemporary supercomputers (i.e., CRAY-1, CYBER 205, and CRAY X-MP). The intrinsic nature of supercomputing is so dynamic that it is amusing to note that the CRAY-1 system on which we provided the initial NSF access is now a curio in our Supercomputer Center lobby.

As mentioned earlier, the NSF program does not yet substantially incorporate the most advanced computing technology. More needs to be done to encourage the development of leading edge supercomputers and to enhance effective user operation of new generation machines. We have become too conservative for such a vital and competitive technology. It is not surprising then that no American industrial company has yet installed a CRAY-2 even though it has been commercially available for two years. It is, however, interesting to note that a private corporation in Japan, Nippon Telegraph and Telephone Corporation, has ordered a CRAY-2 for installation this year. They intend to use it, among other things, to design the next generation of computer components.

III. Proposal for some new approaches

The national scientific community is clearly confronted with a dilemma. The NSF program is not positioned to provide the large demand for supercomputer time. The policy recommendation of the LAX report stated "the most expedient and perhaps least expensive way to provide supercomputer access to the broad range of scientific and engineering researchers is to enhance supercomputer staff at existing centers which have demonstrated sophisticated capabilities for providing large-scale computing." This was not done with the existing Phase 2 centers, but in keeping with the recommendation of the LAX report and the clear need of the scientific community, access to supercomputing facilities at other operating centers should be funded. Certainly, those centers which have already demonstrated sophisticated capabilities should not be closed out of the NSF supercomputing program. Such a move to expand the access to facilities can be done quite cost-effectively. Since the fixed costs at these facilities are already part of their ongoing operational cost, the NSF can use its funds in a very effective and highly leveraged mode. We believe the increased access to such facilities can be done at a modest and smaller increase of NSF budget for supercomputing than would be required otherwise.

In the event that no new resources could be added on to the existing supercomputing program, there is still a way to better address the present demands of the scientific community. Currently the NSF supports a substantial fraction of the total operating costs of its Phase 2 centers, the rest being provided by other sources, such as State support, etc. If the Phase 2 centers could increase their external support even by a modest fraction, the funds so released could be very usefully redeployed in the cost-effective manner discussed above.

We also believe that the NSF should increase its priority in the support of the most advanced leading-edge technologies in supercomputing. This is necessary in order that this country will have a viable competitive edge in technology and industry relative to foreign challenges. A special and highly visible program should be created in the NSF for such an activity. A modest beginning might earmark approximately 10% of the funds being expended on supercomputing today.

STATEMENT OF STEVEN MULLER, PRESIDENT, JOHNS HOPKINS UNIVERSITY, ON BEHALF OF THE COUNCIL OF GRADUATE SCHOOLS, THE ASSOCIATION OF AMERICAN UNIVERSITIES, AND THE NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND GRANT COLLEGES

Senator LAUTENBERG. We have next Mr. Muller.

Mr. MULLER. Senator, I am Steven Muller. I am president of Johns Hopkins University, and I am speaking on behalf of the Association of American Universities, the Council of Graduate Schools, and the National Association of State Universities and Land Grant Colleges.

I would like to make some brief comments about the NSF budget, and I believe I have been given permission also to make some brief—very brief comments—about the NASA budget.

With respect to NSF—and I know that my full testimony is available—the proposed budget of the National Science Foundation seems to the associations for whom I am testifying to be excellent, recognizes the need even in difficult times to invest in two most valuable resources: new knowledge and well-educated people. It demonstrates, in our view, a satisfactory balance between investigator-initiated research and new investments in interdisciplinary centers and human resources.

DOUBLE INVESTMENT IN RESEARCH AND EDUCATION PROGRAMS

The budget request also represents a first step toward the commitment to double investment in the research and education programs of the National Science Foundation by fiscal year 1992, which we believe is sound policy.

So, we believe the budget proposal merits the support of this committee and the Congress, and we congratulate Dr. Bloch for a job we think well done.

The three areas that are of the greatest interest to us are the role of research centers as a strategy or vehicle for meeting our needs in science and technology; the support for science and engineering education; and then the need to begin to address the research facilities' needs, particularly of the major research universities.

As a country, we are currently failing to make the investments necessary for a technologically healthy economy. Although institutions themselves are making a considerable effort, often with the assistance of state governments, many of the research laboratories which house national research programs are no longer hospitable or efficient sites for the conduct of modern science. And here, there has been a vacuum of federal leadership.

We believe that the National Science Foundation ought to provide that leadership by articulating the problem clearly and mobilizing all the major research agencies in a cooperative effort to address it.

The recent report by a special panel of the White House Science Council chaired by David Packard recommended a 10-year competitive matching grant program to be established in NSF, funded at $500 million a year. We agree with that recommendation.

Representative Roe in the House on April 1, with several of his colleagues on the House Committee on Science Based on Technology introduced H.R. 1905, the University Research Facilities Revitalization Act of 1987. That bill is generally consistent with the Packard Panel recommendations, and we hope very much for the passage and funding of a bill such as the Roe bill, so that we can get a competitive program to enhance the nation's major research facilities.

If I may, Mr. Chairman, I would like to say a few words on the NASA budget.

NASA BUDGET

Senator LAUTENBERG. Yes; you have been invited to do that, and I am sorry I didn't mention it at the beginning. But certainly, please go ahead.

Again, I will try to be very brief and, in this case, make a reference to my own institution. I speak here particularly for the Space Science Working Group of the Association of American Universities to testify how essential we believe it is to the economy, welfare, and security of the nation that the United States retain its position of leadership in space.

So, we call upon the President and the Congress to commit this nation to strive toward a civilian space program that is second to none, and that the necessary fiscal year 1988 resources be provided to achieve this goal.

An important part of rebuilding our space program should be our preeminence in space science. For many years, the United States led the world in space science, and our achievements provided a visible demonstration of the nation's scientific and technological prowess.

In recent years this lead has eroded, and in some areas the lead has been lost to other nations, so that we are really concerned that there be a substantial space science ingredient in the space program.

Johns Hopkins happens to be the home of Space Telescope Science Institute, and we also have a significant amount of astronomy and space science on our full-time faculty outside the Space Telescope Science Institute.

HOPKINS ULTRAVIOLET TELESCOPE

We were all set to launch a unique and exciting experiment called the Hopkins Ultraviolet Telescope as part of NASA's Astro-observatory on Colombia last March; and then, of course, the ill-fated *Challenger* mission led to the serious interruption in the shuttle program.

Now, the people that worked on this project had worked on it since 1978. This was to have been the first of three planned shuttle flights of this telescope in 1986 and 1987. Had it been launched on schedule, it would have made extremely valuable observations of Halley's Comet. There was even serious consideration at NASA of extending the Astro-program to a total of six shuttle missions, and scientists all around the country were invited to participate in the program by submitting their own ideas for observations to be made with HUT and with Astro.

Now, what is the status of this exciting program, on which so many scientific hopes and careers depended? Only one mission for Astro remains on the post-Challenger manifest, just enough to whet the appetities of the people involved, but with no plans to follow up with further investigation of the discoveries which are likely to be made.

The 3-year delay and the drastic reduction in the scope of this project is a perfect example of the disaster which our space science program has reaped from the *Challenger* tragedy, and the lack of any alternative means to place experiments in orbit.

Important as manned flight is, expendable vehicles for space science seem to us absolutely essential. In other words, an unmanned vehicle alternative to the resumption of the shuttle program.

Mr. Chairman, I know it is late. A lot of what I want to say is in writing. I will stop here, if I may, and would be happy to answer questions.

Senator LAUTENBERG. You are very kind.

[The statement follows:]

STATEMENT OF STEVEN MULLER, PRESIDENT, JOHNS HOPKINS UNIVERSITY, ON BEHALF OF THE ASSOCIATION OF AMERICAN UNIVERSITIES, COUNCIL OF GRADUATE SCHOOLS IN THE UNITED STATES, AND NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND-GRANT COLLEGES

Mr. Chairman, Members of the Committee:

I deeply appreciate the opportunity briefly to discuss with you the proposed budget of the National Science Foundation; and I speak on behalf of the Association of American Universities, the National Association of State Universities and Land Grant Colleges and the Council of Graduate Schools.

In our view the proposed budget of the National Science Foundation is an excellent one, which recognizes the need, even in difficult times, to invest in two most valuable resources: new knowledge and well-educated people. The budget demonstrates a satisfactory balance between investigator-initiated research and new investments in interdisciplinary centers and human resources. The budget request also represents a first step toward the commitment to double investment in the research and education programs of the National Science Foundation by fiscal year 1992, which is sound policy. I believe the budget proposal merits the support of this Committee and the Congress, and I congratulate Dr. Bloch for a job well done.

There are three topics which I would now like very briefly to address.

1. The role of research centers as a strategy or vehicle for meeting our needs in science and technology;
2. The Foundation's science and engineering education proposals;

3. The need to begin to address the research facilities needs of universities.

1. Research Centers and Groups

Increasing the share of the National Science Foundation budget devoted to the support of interdisciplinary and/or multidisciplinary research centers is -- at the current time -- an appropriate investment strategy. With the following cautions that reflect the serious challenges to success which lie ahead, we support the Foundation's proposals.

The rate of expansion of National Science Foundation funding for research centers should be cautious, retain its flexibility, and be the subject of ongoing evaluation. The National Science Foundation has a difficult job to do. Success is not preordained. The job must be done thoughtfully, sensitively and well. Therefore:

The performance of each center should be evaluated at stated intervals over its lifetime. Support for them should be time-limited. The National Science Foundation must protect its future flexibility.

Fields should be selected carefully, experimentation with different forms should be encouraged.

The role and responsibility of the centers to the education of undergraduate and graduate students should be ensured.

We are particularly pleased that the Foundation has sustained its commitment to individual, investigator-initiated research. It would be a serious mistake to develop the new centers at the expense of the Foundation's core research programs. Contemporary academic science requires both the sustained commitment to individual investigators and the development of new organizational modes, such as centers and groups.

2. Engineering and Science Education

The National Science Foundation has a unique role to play. It must give its leadership to efforts designed to strengthen science, mathematics and engineering education at all levels of our educational system. As the Foundation's budget grows toward its FY 1992 objective, the education programs must grow along with the research budget.

The nation's universities applaud the Foundation's efforts to strengthen our schools through its efforts to develop improved teacher preparation programs, improved use of instructional materials and technology, and better science and mathematics curricula.

At the undergraduate level, we support the Foundation's efforts to provide for a closer coupling of undergraduate instruction with research activities. We also recognize the need for special programs to improve undergraduate programs, especially instructional equipment. The undergraduate effort remains inadequate to the needs. Last year seven higher education associations prepared a special report on the needs of undergraduate science education. The report identified undergraduate instructional equipment and materials and faculty development as the two top priorities. The report was presented to this Committee.

At the graduate level, we heartily endorse the proposal to add 200 new graduate fellowships per year. This investment will pay great dividends. We simply must do a better job of attracting greater numbers of U.S. citizens, especially women and minorities, into graduate programs and careers in science and engineering. Therefore we welcome the expansion of the graduate fellowship program and the continuation of the Presidential Young Investigators Program.

3. Research Facilities and Equipment

Turning to my final point, our universities face a very serious problem of obsolescence in their research laboratories.

During the past 20 years, federal investment in university research buildings has declined by 95 percent.

The National Science Foundation, and other agencies such as the National Institutes of Health, have taken steps to address the documented needs for research equipment. The National Science Foundation, for example, now allocates almost 20 percent of its research budget to equipment. Essentially nothing, however, has been done by the Foundation or any other agency to address the research facilities deficit.

We are failing to make the investments necessary to a technologically healthy economy. Although institutions themselves are making a considerable effort, often with the assistance of state governments, many of the research laboratories which house national research programs are inhospitable and inefficient sites for the conduct of modern science.

There is a vacuum of federal leadership. We believe that the National Science Foundation ought to provide that leadership by articulating the problem clearly and mobilizing all of the major research agencies in a cooperative effort to address it.

The recent report by a special panel of the White House Science Council chaired by Mr. David Packard, recommended that a 10-year, competitive, matching grant program be established in the National Science Foundation, funded at $500 million per year. We agree.

On April 1, Representative Roe, with several of his colleagues on the House Committee on Science, Space and Technology, introduced H.R. 1905, the "University Research Facilities Revitalization Act of 1987." The bill is generally consistent with the Packard Panel's recommendations. We urge the prompt passage and funding of the bill as part of a Congressional competitiveness initiative.

Conclusion

Thank you for the opportunity to share these views with you. I will be pleased to respond to your questions.

Statement on the
FY 1988 NASA SPACE AND EARTH SCIENCES PROGRAM

presented by
STEVEN MULLER, PRESIDENT
THE JOHNS HOPKINS UNIVERSITY

on behalf of
SPACE SCIENCE WORKING GROUP
ASSOCIATION OF AMERICAN UNIVERSITIES

and the
NATIONAL ASSOCIATION OF STATE UNIVERSITIES
AND LAND GRANT COLLEGES

SUMMARY

The Space Science Working Group (SSWG) of the Association of American Universities, believes that it is essential to the economy, welfare,and security of the nation that the United States retain its position of leadership in space.

We call upon both the President and the Congress to commit this nation to strive toward a civilian space program that is second to none and that the necessary FY 1988 resources be provided to achieve this goal.

An important part of rebuilding our space program should be our preeminence in space science. For many years the United States led the world in space science, and our achievements provided a highly visible demonstration of the nation's scientific and technological prowess. However, in recent years this lead has eroded, and in some areas the lead has been lost to other nations.

We are pleased to note that there is a new start for the Global Geospace Science (GGS) program in the NASA budget request. GGS is an important step that needs to be taken to retain our leadership, but only one of many that needs to be taken. The SSWG believes that it is essential that the following issues be addressed in the FY 1988 NASA budget:

(1) FREQUENT AND ASSURED ACCESS TO SPACE

Frequent and assured access to space is essential to a vigorous space science program. Even when the Shuttle resumes flight, it cannot provide for timely launching of all the space science missions under development, let alone major new undertakings now being planned. It is essential that the necessary resources be provided to NASA to acquire an Expendable Launch Vehicle (ELV) capability for both major and moderate sized missions.

(2) THE VITALITY OF THE UNIVERSITY INFRASTRUCTURE

The health of the university research enterprise is essential to the vigor of the NASA space programs, to the vitality of U.S. science and technology and, indeed, to the intellectual and technological competitiveness of our nation.

NASA has reprogramed $20-25M in each of FY 1987 and FY 1988 to enhance the vitality of university-based research activities through the research and Analysis (R&A) and Suborbital programs. However it is only with a sustained infusion of new money over time that true vitality can be reached. We recommend that at least an additional $25M, in new funds, be provided for this effort which is particularly important to provide continuity to the research and education being conducted at universities.

(3) ADVANCED TECHNOLOGY

It should be noted that NASA's Office of Space Science and Applications advanced technology development (ATD) activities contribute to the nation's technological competitiveness. ATD activities develop the technology and instrumentation required for new space science missions and thus promote the use of cost effective state-of-the-art technologies.

ATD funds should be provided for several missions at this time to insure that the nation's space science program is conducted with the most effective and advanced technology.

(4) NEW SCIENCE

Preeminence in a national space science program requires vigorous support for new and continuing scientific opportunities in basic research. The proposed FY 1988 new start for the Global Geospace Science program will ensure a leadership role for the United States in solar-terrestrial physics. But this is only one of many fields which provide challenging scientific questions and which are waiting to be pursued.

All of our recommendations, aside from ELVs, would require less than $100 million.

The decisions that will be made on the nation's space program this year will determine the future of this endeavor for decades to come. Let us move forward decisively to ensure that this nation's lead in all aspects of space, once so proudly held, can be regained.

The Space Science Working Group (SSWG) of the Association of American Universities, together with scientists throughout the space science community, believe that it is essential to the economy, welfare, and security of the nation that the United States retain its position of leadership in space.

We call upon both the President and the Congress to commit this nation to strive toward a civilian space program that is second to none. We ask that the necessary resources be provided in the FY 1988 NASA budget to put us firmly on the path to achieving this goal.

We believe that one of our national goals in rebuilding our space program should be preeminence in space science. For many years the United States led the world in space science, and our achievements provided a highly visible demonstration of the nation's scientific and technological prowess. However, in recent years this lead has eroded, and in some areas the lead has been lost. The last American planetary mission was launched in 1978 and conceived a decade earlier. The Soviets, meanwhile, have pursued a vigorous program in planetary exploration, and are undertaking a series of missions to Mars even more ambitious than the important Mars Observer mission being developed in the United States. Comet Halley was visited by probes from the Soviet Union, Europe, and Japan, but none from this country. In certain areas of astronomy, particularly x-ray astronomy, we have been reduced to playing a supporting role in projects undertaken by Europe and Japan. In earth observing studies, the United States has a slim lead, but one that risks being overtaken by other nations' programs.

The SSWG is pleased to note that there is a new start for the Global Geospace Science (GGS) program in the FY 1988 budget request for NASA. In this program, the United States will provide two spacecraft as part of the International Solar Terrestrial Physics (ISTP) program to study the flow of energy and material from the Sun, through interplanetary space, and throughout the Earth's magnetosphere. Indeed, GGS is a paradigm for the actions we must take to retain our leadership position in space science. In FY 1987 funds were provided for United States instruments to be flown in supporting roles on the European and Japanese missions that will be part of ISTP. Only with the GGS program, and the spacecraft it will provide, does the United States have a leadership role in ISTP.

The new start for GGS is an important step that needs to be taken to retain our leadership, but only one of many that needs to be taken. The SSWG believes that it is essential that the following issues be addressed in the FY 1988 NASA budget: (1) Frequent and assured access to space, (2) the vitality of the university infrastructure, (3) the development of advanced technologies and (4) the continuing pursuit of new science.

FREQUENT AND ASSURED ACCESS TO SPACE

Frequent and assured access to space is essential to a healthy space science program. Even when the Shuttle resumes flight, it cannot provide for timely launching of all the space science missions under development, let alone major new undertakings now being planned. It is essential that the necessary resources be provided to NASA to acquire an Expendable Launch Vehicle (ELV) capability. Without ELVs there will be little future for U.S. space science.

Frequent access to space is another cornerstone of a vigorous space science program. Large missions such as the Space Telescope have a vital role to play, but a healthy program cannot be constructed solely from large missions where experiments in any one scientific subdiscipline come along only once every generation. NASA must have the resources to increase the frequency of moderate missions such as those which can be launched on Delta or Scout-class vehicles. Moderate missions serve many key roles: they provide the ability to explore new fields of space and earth sciences; they are the vehicles by which new techniques and ideas are proven and perfected; they provide a means for quick-response studies of new, unexpected phenomena; and they allow focused studies of key problems which require dedicated missions and unusual orbits. Finally, moderate missions can be carried out frequently enough to keep the pace of discovery at the levels necessary to attract and keep the highest quality researchers in the field.

We wish to note that the schedule of several current major missions could be accelerated if ELVs were available. For example, the EUVE Explorer, Mars Observer, ROSAT and Ulysses missions could readily be launched on Titan or Delta ELVs and at earlier dates than if launched from the Shuttle. We strongly recommend that procurement of additional ELVs for launch of space science missions be initiated and that, where necessary, funds be added to the FY 1988 budget to provide for a mixed-fleet capability.

THE VITALITY OF THE UNIVERSITY INFRASTRUCTURE

The health of the university research enterprise is essential to the vigor of the NASA space programs, to the vitality of U.S. science and technology and, indeed, to the intellectual and technological competitiveness of our nation. As such, the health of university research and education should be of central concern to our national science policy, and to all federal research agencies including the mission agencies. Unfortunately, over time, NASA has neglected its university infrastructure when it should have been nurturing it.

This was not always the case. In the 1960's, NASA had a deliberate policy and program to ensure a healthy scientific infrastructure of research projects, research personnel, and facilities. The revitalization of the university scientific infrastructure established 20-30 years ago is now long overdue. An already poor situation at universities was exacerbated by the grounding of the Shuttle after the Challenger accident.

In the FY 1987 and FY 1988 budgets, NASA has reprogramed $20-25M to enhance the vitality of university-based research activities through the research and Analysis (R&A) and Suborbital programs. However, at this level of funding in the current fiscal year, NASA's Office of Space Science and Applications was able only to keep some essential components of space science research from dying altogether. For example, the funding to support data analysis for ongoing missions in the Space Plasma Physics area is slated to be cut 20% in the FY 1988 budget from FY 1987 levels. The action follows a plan devised several years ago, well before the Challenger accident, and which continues to be carried out despite the productivity of the existing satellite analysis activities it supports in the universities, and despite resolutions of the Space Science Board and other advisory committees. Of the roughly $4M to be cut in this case, approximately $0.5M may be restored from the reprogramed funds.

True vitality can not be restored in any one year for $20-25M. It is only with a sustained infusion of new money over time that true vitality can be reached. The SSWG can commend and support the concept behind NASA's plan in FY 1987 and 1988 to revitalize university space science. However, we recommend that at least an additional $25M, in new FY 1988 funds, be provided to this effort for Research and Analysis, Data Analysis, and the Suborbital programs, particularly in areas that affect the endangered university space research effort. Funds for data analysis, and for balloons and rockets in the Suborbital program, are particularly important to provide continuity to the research and education being conducted at universities.

ADVANCED TECHNOLOGY

Concern exists throughout the country for the competitiveness of American technology in the international marketplace. There are several federal initiatives which will contribute towards reestablishing our national competitiveness. The National Science Foundation (NSF) is requesting FY 1988 funds to initiate cooperative programs between universities and industry in advanced engineering. NASA is requesting funds for the Civilian Space Technology Initiative to reestablish NASA as a leader in the development of space and aeronautics technology. It should be noted that NASA's Office of Space Science and Applications advanced technology development (ATD) activities also contribute to the nation's technological competitiveness. ATD activities develop the technology and instrumentation required for new space science missions. ATD is very important to the space science program because it promotes the development and use of state-of-the-art technology for science missions.

Indeed, such funds not only ensure that our technology is at the forefront, but also that our missions are cost-effective.

Through the use of ATD funds, difficult components of a mission can be developed in advance of a new start, and reduce the likelihood of costly overruns during fabrication. ATD funds should be provided for the Comet Rendezvous Asteroid Flyby (CRAF) mission and the Advanced X-Ray Facility (AXAF), and for the development of other missions and instrumentation, to insure that the nation's space science program is conducted with the most effective and advanced technology.

NEW SCIENCE

Preeminence in a national space science program requires vigorous support for new and continuing scientific opportunities. Basic research is a necessary and fundamental component of our broad national and federal goals of health, welfare, security and economic competitiveness. As such, it should be given priority consideration and planning by national decision makers. The basic research programs supported by NASA are as important to our national goals as any other federal research program.

The proposed FY 1988 new start for the Global Geospace Science program will ensure a leadership role for the United States in solar-terrestrial physics. But this is only one of many fields which provide challenging scientific questions and only one of many fields in which the United States must compete. I want to mention some examples of other science efforts, which should be as soon as possible and which can be undertaken in FY 1988. They include:

> Life Sciences: The United States plans to establish a permanent manned presence in space. However, adequate research on long-duration human space flight does not exist in this country. The scientific approaches have been defined, but they have yet to be carried out by the scientific community. A vigorous life sciences research program aimed at overcoming the physiological and psychological barriers to long-duration flight should be pursued. In FY 1988, a $15M augmentation would allow this program to maintain its current efforts and build toward our future needs.

> The High Resolution Solar Observatory (HRSO): HRSO, which is planned to be the cornerstone of future studies of the sun, is a reduced-scope and less costly version of the earlier planned Solar Optical Telescope. HRSO is a facility-class instrument which will make high-in measurements of the fundamental properties of the surface the sun. It is a candidate for Space Station instrumentation. Development of this mission should begin as soon as possible; $12M in FY 1988 funding would provide adequate funds to initiate this development.

> Explorers: The Explorer program, which has been one of the most scientifically productive and cost-effective programs in the history of space science, is in deep trouble. As a result of the Challenger accident, it has had to absorb more than $100M in were redirected to modification of COBE to permit a Delta launch in FY 1989. As a result, currently planned missions have been delayed and new missions cannot be started. The U.S. space science community has brought forward numerous ideas for world-class scientific investigations that can be carried out with moderate missions such as those launched on Scout or Delta-class rockets. The strong interest in such missions has been amply and repeatedly demonstrated, for example, by the 43 Explorer proposals received by NASA last summer. An additional $30M per year should be provided to the Explorer line to ensure the timely execution of these missions.

Here I have described only three examples of space and earth sciences programs in need of support; there are many more scientific opportunities waiting to be pursued.

I have briefly outlined what the Space Science Working Group believes to be the necessary components of a vigorous and world-class space science program. The decisions that will be made on the nation's space program this year will determine the future of this endeavor for decades to come. Let us move forward decisively to ensure that this nation's lead in all aspects of space, once so proudly held, can be regained.

Thank you for the opportunity to present this testimony. I would be pleased to answer any questions.

ADDITIONAL PREPARED STATEMENTS—NATIONAL SCIENCE FOUNDATION

Senator LAUTENBERG. Because of time constraints, numerous witnesses were unable to make an oral presentation on the NSF budget. Nevertheless, their prepared statement have been received and will appear at this point in the record.

[The statements follow:]

STATEMENT OF THE ENGINEERING EDUCATION TASK FORCE OF THE AMERICAN SOCIETY FOR ENGINEERING EDUCATION, NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, AND NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND GRANT COLLEGES

We appreciate this opportunity to share our views on the National Science Foundation budget for Fiscal Year 1988. This statement is being submitted for the record by the Engineering Education Task Force, a multi-society group working together to address major issues in engineering research and education. Member organizations are the American Society for Engineering Education (ASEE) including its Engineering Deans Council, the National Society of Professional Engineers (NSPE), and the National Association of State Universities and Land Grant Colleges (NASULGC).

ASEE is a membership society of more than 10,000 faculty, as well as schools of engineering and engineering-oriented industries. NSPE is a professional society representing 75,000 professional engineers in industry, private practice, government and education. NASULGC is a higher education association whose member colleges and universities educate more than two million of the nation's students.

The Engineering Education Task Force strongly endorses the proposed FY 1988 budget for the National Science Foundation (NSF). We believe the substantial increases proposed for engineering research and education recognize the vital role of the nation's engineering enterprise in strengthening U.S. economic competitiveness and the quality of life. It is the research achievements and education of young engineers and scientists today that will lead the nation into the high technology future of the 21st century. Our comments will focus on the education programs within the Foundation.

NSF Education Programs

Continued support for NSF precollege mathematics and science programs is important to the health of engineering and scientific research and education. Highly motivated, well-prepared students must come out of the high school pipeline or the nation will face a serious shortage of the engineering workforce necessary for the increasing needs of government, industry and academe. NSF precollege programs in recent years have helped spur a nationwide effort to improve precollege mathematics and science. They can inspire such efforts as the MATHCOUNTS program sponsored by NSPE in which seventh and eighth grade students receive coaching and participate in mathematics competitions, and the Junior Engineering Technical Society (JETS) sponsored jointly by ASEE and NSPE.

Expansion of graduate programs at NSF forms another key link in strengthening the engineering education system. Expanding the number of graduate fellowships, Presidential Young Investigator (PYI) awards, and engineering research initiation awards will help more institutions attract, keep and develop promising young engineers as graduate students and faculty members. One of the most serious problems facing schools of engineering today is the shortage of faculty: a 1985 ASEE survey showed an 8.8 percent vacancy rate in funded engineering faculty positions. The figure rises to an alarming 19 percent if one considers restoring the faculty-student ratios of the mid-1960's. There are several reasons for the faculty shortage -- including higher salaries and better research facilities in industry -- but prestigious NSF fellowships and research opportunities offer important incentives for the brightest students to consider academic engineering careers.

The Undergraduate Education Initiative

Of special significance to the engineering community is the Foundation's proposed initiative in undergraduate education. Over the past several years, NSF has maintained strong graduate education programs and since 1983, has considerably upgraded its precollege activities. But since the 1970's, undergraduate education -- the vital bridge between high school and graduate study -- has been sorely neglected at the Foundation. This new undergraduate initiative will begin to redress that unhealthy situation.

Unlike the scientific disciplines where the principal point of entry into the professions is the doctoral degree, more than two-thirds of the nation's new engineers complete their formal education with the baccalaureate degree. This makes it particularly critical that undergraduate engineering education be first-rate; most engineers do not go to graduate school to learn the technological tools and processes of their profession.

Serious Problem Areas

Partly because of its own success and because of increasing government and industry demand for engineers, the engineering education system is under severe strain. Engineering enrollments have doubled over the past 10 years at the same time that engineering schools have been experiencing serious fiscal constraints. In combination with other factors, this strain on resources has led to:

--- serious overcrowding of classrooms with resulting faculty overload, loss of morale and "burnout",

--- a severe shortage of engineering faculty, particularly in such areas as electrical and computer engineering. The ASEE 1985 survey showed an 8.8 percent vacancy rate in funded engineering faculty positions, up from 8.5 percent in 1983,

--- inability to update curricula to reflect rapidly changing technologies and engineering practice,

--- deterioration of laboratory experiences because of obsolete equipment and facilities, along with the rapid pace of change in instrumentation,

--- continuing low numbers of U.S. engineering students going on to graduate study and attainment of the PhD. The ASEE 1985 survey showed that only 59 percent of engineering graduate students were U.S. citizens; the remaining slots were filled by non-citizens,

--- reduced rate of success for engineering schools in attaining a full six year accreditation rating.

These problem areas have been well-documented in such recent reports as the National Science Board's Undergraduate Science, Mathematics and Engineering Education (NSB 86-100) and ASEE's Quality of Engineering Education.

The Role of NSF

NSF cannot be expected to address these problems singlehandedly nor to remedy the situation overnight. But what the Foundation can do is what it does best: demonstrate federal leadership in an area of national importance, serve as a catalyst for the best minds in academia to turn their attention to researching and developing solutions to the problems, and leverage resources from industry, state and local governments and academic institutions in a broadly-based, synergistic effort to address the challenge.

We believe NSF's proposed $68 million program for FY 1988 is an important step in this direction and we applaud the Foundation's foresight and commitment to substantially improving undergraduate engineering and science education.

What Can NSF Do?

Curricula Reexamination. By providing a nationally competitive, merit-based program of support, NSF can inspire major reexamination of engineering curricula including means of incorporating design, synthesis, computer integration and engineering systems into curricula, as well as finding innovative ways of making teaching more effective and efficient. This can include development of new computer softwares, creation of self-paced learning modules or new instructional technologies for face-to-face and learning at a distance.

Laboratory Redevelopment and Instrumentation. In recent years, the engineering laboratory experience for both undergraduate and graduate students has deteriorated. In conjunction with curricular redesign, the laboratory experience must be revitalized. Efforts are needed to find cost-effective ways of providing students with hands-on technical experience, including exposure to contemporary engineering practice and today's technologies.

Faculty Development. A wide variety of NSF-fostered activities could increase the attractiveness of faculty careers and contribute to the lifelong professional development of individual faculty members. The possibilities include new research opportunities not only in technical fields but in engineering teaching and learning, as well as expanded workshops, seminars, sabbatical leaves and faculty networking.

Undergraduate Research. Opportunities for promising undergraduates to experience first-hand the rewards and challenges of academic research could prove a major new incentive for students to continue on to graduate study and academic careers.

Summary

Through the Foundation's leadership, its role as a catalyst for activity, and its ability to leverage resources, we believe these programs will generate a nationwide effort to revitalize undergraduate science and engineering education. This, in turn, will help ensure the nation sustains the skilled, well-educated and flexible workforce necessary for it to remain competitive in the economic, industrial and national security spheres.

Once again, the Task Force urges you to fully support the FY 1988 budget request of the National Science Foundation. We believe the Foundation's research and education programs -- particularly the undergraduate education initiative -- represent a sound investment that will benefit the nation both now and in the decades to come.

STATEMENT OF D.R. BROWN, VICE PRESIDENT AND DEAN OF ACADEMIC SERVICES, PURDUE UNIVERSITY

Testimony on Advanced Scientific Computing at the National Science Foundation

Purdue University appreciates this opportunity to present testimony on Advanced Scientific Computing at the National Science Foundation. It is especially appropriate for Purdue to present such testimony since Purdue was one of the first universities in the United States to have installed a modern supercomputer for Large Scale Scientific Computing. In the very early 1980s there was a great deal of discussion in many prestigious scientific committees about the failure of the United States to provide adequate computing power to its scientists and engineers. It was becoming increasingly clear that scientists in other countries, and most particularly in Japan, were being provided with access to the most modern computing equipment at their universities. It had been pointed out in a number of major reports, including one associated with the name of Peter Lax of New York University, and another with the names of Kent K. Curtis and Marcel Bardon of the National Science Foundation, that the United States was falling seriously behind in this very important area, and that Large Scale Scientific Computing was important enough to affect the total quality and volume of scientific research in this country.

While most universities waited for federal action to be taken to provide support for supercomputing, a small number of universities, namely the University of Minnesota, Colorado State University, and Purdue University, went ahead on their own to establish major supercomputer centers. At Purdue University, after considerable study in 1980 and 1981, it was decided to order a Cyber 205 system from Control Data Corporation. An order was placed in November of 1981 and the system was delivered and installed in January of 1983. We wish to emphasize the fact that at Purdue University no federal funds were used in the initial purchase of this supercomputer. Purdue University presented a very strong request to the Indiana State Legislature for funds to purchase this equipment, and the Legislature responded by providing bonding authority in the amount of 6.5 million dollars for this purpose. Control Data Corporation cooperated by providing a Cyber 205 supercomputer at a drastically reduced price to make it possible for the University to make the purchase with the amount of money provided by the State Legislature.

By the time the supercomputer had been delivered at Purdue University, the Congress of the United States had taken some action to help avert the crisis in large scale computing that had been pointed out by the reports mentioned above and by a number of other similar reports. The Congress had added funding to the budget of the National Science Foundation to be used to help improve the status of large scale computing for Scientists and Engineers in the United States. The National Science Foundation responded by setting up a Supercomputer Task Force. This task force issued a request for proposals to provide supercomputing services for the research community in the United States. The program under which grants were to be provided was called the Advanced Scientific Computing Resources Program. The supercomputer task force was superceded by the Office of Advanced Scientific Computing.

Purdue University submitted a proposal entitled "Supercomputer Resources at Purdue University" to the National Science Foundation on December 19, 1983. This proposal, which is on file at the National Science Foundation, offered to provide supercomputer services to NSF grantees at Purdue and at other universities as specified by the National Science Foundation. Purdue offered to provide these services at a reasonable price, and to provide a complete service that would make it possible for users to become expert at using the supercomputer and to obtain excellent results from the availability of the supercomputer and of a well trained and dedicated consulting staff associated with the supercomputer.

As a result of an evaluation of this proposal, and through the standard NSF processes for making such grants, Purdue University was allocated 1.8 million dollars for the first year and was promised additional allocations in future years if the services during the first year were found to be of good quality and worthy of continuation. The services at Purdue were periodically evaluated, and each time they were evaluated the evaluation found improvements in the services and made strong recommendations that the services be continued. As a result of the various renewals of the initial cooperative agreement entered into between Purdue University and the National Science Foundation, the Purdue University Computing Center received a total of just over 4.5 million dollars from the National Science Foundation to provide supercomputer services to NSF users. As a result of evaluations by the users and by the NSF there seems to be general agreement that the services offered were of a high degree of excellence and were of great value to the Scientific Community. One of the major projects supported dealt with the analysis of the structure of large molecules of importance in biological processes. The very large amount of computing power available made it possible to determine many important aspects of the structure of the virus that is responsible for the common cold. This work was done by Professor Michael Rossmann and his colleagues at Purdue University. As a result it may eventually be possible to construct specific antitoxins that are effective against the common cold in human beings. It should be understood that the analysis of this virus molecule required a huge amount of computing, an amount that it would be impossible to provide without the availability of a modern supercomputer.

The NSF Resources Program was of great value to the scientists using the program and to the organizations that provided the computing for the program. The original supercomputer at Purdue was a rather minimal supercomputer, with one million words of memory and six high speed disk units. As a result of Purdue's participation in the NSF Resources Program Purdue was able to expand the supercomputer to a much more effective system, with four million words of main memory and with additional significant amounts of tape and disk storage.

The Resources Program for providing supercomputer services to scientists and engineers throughout the United States was in many ways an excellent model for providing such services in the American university system. It was very much to the mutual advantage of the universities participating as providers, and of the users of the various supercomputers that provided supercomputer resources under contract with the National Science Foundation. We feel that it is unfortunate that this model has fallen into disuse. The Office of Advanced Scientific Computing inherited the resource model from the NSF supercomputer task force. They almost immediately announced that they preferred a totally different model in which a few new supercomputer centers would be set up and in which NSF support of supercomputing would be limited to support of these few centers. Originally it was expected that there would be ten or fifteen such centers, but as the program developed the number of centers was limited to five, and there seems to be at least a possibility that the number will be cut still further down to four.

We at Purdue find this model unattractive for a number of reasons. For one thing it seems basically uneconomical compared with what was achieved and what could have been achieved under the resources model. Because it is uneconomical it makes it almost necessary for the NSF to limit its support of supercomputing very drastically. There is no way that these five centers can provide all of the supercomputing needed by the American scientific community. The new program at the NSF has resulted in a phasing out of the resources program. This results in an attempt to force all NSF supported large scale computing to be handled by these five new supercomputer centers. Universities like Purdue that have already made major investments in installing supercomputers, and that have developed expertise in providing supercomputer services, are told that it is the policy of the NSF not to support their use beyond the extent to which they have already been supported. All of their non local NSF users have been forced to move their computing to the supercomputer centers. Local users are told that they will be denied NSF support for their computing except and to the extent that they can move their computing to the supercomputer centers. At Purdue and at other universities that have established major supercomputer centers of their own, we are left with the anomalous situation where local scientific users of supercomputing must compute at remote and inconvenient sites if they are to be provided with NSF support for their computing. Their supercomputer centers that have grown with the support of the NSF are now told that they must proceed on their own without further support from the NSF.

Since it is obvious to many major universities that the five supercomputer centers will not be adequate to provide computing for the entire scientific community, many states are moving to establish their own supercomputer centers. Now along with Purdue in Indiana and Colorado State University and the University of Minnesota, their are other major universities such as the University of Texas, the University of Georgia, the University of California, and Ohio State University that either have moved or are moving to establish supercomputer centers for researchers within their states.

We argue that it makes very little sense to require that a researcher at the University of Texas must do his computing at one of the very remote NSF supercomputer centers if he is to obtain any support for computing from the NSF. It makes a great deal more sense to provide support for researchers in Texas at the Texas supercomputer system and to provide support for researchers in Georgia on the Georgia supercomputer system, etc. We especially feel that this kind of support should be provided to researchers at Purdue to perform their computing on the Purdue supercomputer, in view of our own proven ability to provide excellent supercomputer services.

In this testimony we have tried to point out our distress at the ending of a program that has been very productive and very successful. We feel that the Supercomputer Resources Program or something quite similar could have been carried on and extended to provide supercomputer services more economically and more equitably than can be done under the Supercomputer Centers Program. We argue very strongly that supercomputer users at universities that provide local supercomputer services should be supported in their computing at their local supercomputer centers and should not be driven to use remote and inconvenient facilities. We feel that the net result of this type of program would be to encourage the growth of supercomputing in the United States far more than it will be encouraged through the support of just a few very expensive centers. We are pleased that the NSF has been given funding to support supercomputing. We feel that a great deal more supercomputing could be supported with these funds if the NSF would cooperate with major universities in providing their supercomputer centers with the kind of support that they need.

STATEMENT OF THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

The American Institute of Biological Sciences (AIBS) is a federation of 40 professional societies and research laboratories representing over 70,000 life scientists who are integrally concerned about the course of science research and education in America. We are pleased to take this opportunity to voice our enthusiastic support for the President's budget request for the National Science Foundation, (NSF), for FY 88.

As you know, the President's budget requests a total of $1.893 billion, an increase of 17 percent over last year. Of this amount, $1.693 billion would support research and development--the cornerstone of NSF's activities. The Foundation's budget will be devoted to three major areas: Developing Human Resources and Broadening Participation; Science and Technology Centers and Groups; and Basic Disciplinary Programs. We believe that these three areas of emphasis will provide a sound framework for our renewed national commitment to science research and education.

For some time we have been concerned about science education both at the undergraduate and graduate levels in this country. Recent reports of the White House Science Council, the National Science Board and the American Council on Education have confirmed serious problems with the quality and size of the talent pool, the very people we will be depending on to keep the United States a competitive leader on the world scene in the years ahead. We believe that the renewed emphasis in federal support for science education through the NSF will help to reverse the downward trend of years past. The Foundation's FY 88 budget provides a total of $273 million in education and human resources. These funds will be used both to increase on going efforts and to initiate a set of new activites aimed at certain strategic points in the educational sequence and in professional development.

It has become obvious to the scientific community that better efforts must be made at the pre-college level in order to interest talented students in science careers. For FY 88, about $68 million will be invested by NSF in pre-college activities including efforts for improved teaching, enrichment activities for talented high school studies and special opportunities for "hands-on" research. We firmly feel that these investments are absolutely critical in order to encourage interest in science and science careers at the earliest age possible.

The National Science Board has documented the overwhelming need for improvement in the quality of undergraduate education. Under the proposed request, NSF will more than double its support for this segment to nearly $70 million. We believe that planned expansion in areas such as student research participation, faculty enhancement and laboratory instruction is a sound investment in the future.

At the graduate and post-doctoral levels, NSF plans to place emphasis on support for interdisciplinary training opportunities. For FY 88, 1700 fellows, 14,000 graduate assistants and nearly 3700 postdoctoral associates will receive support. Since the principal professional training of our Nation's scientists is achieved through these mechanisms, we heartily support this proposed course. We all agree that the availability of well-trained scientists is essential to a healthy, growing economy. For this reason, we urge you to support the education activities proposed by NSF under its FY 88 plan.

The area of our most specific concern is federal support for programs in the life sciences. A word about the research budget of the Biological Behavioral and Social Sciences (BBBS) directorate is therefore appropriate. The request for the BBSS is $297 million, an increase of just over 15 percent over the 1987 current estimate. Roughly $227 of the $297 million is devoted to life sciences programs. Sub-activities will increase support for research critical to the expanding area of biotechnology, such as genetics and biochemistry. Cellular Biosciences will support research applying new genetic and immunological techniques to understanding basic cellular processes. Other areas of biology will receive emphasis as well. For example, the 13 percent increase afforded the Biotic Systems and Resources sub-activity will allow for increased focus on global ecosystem dynamics. This area of inquiry is of critical importance because ecosystems rapidly change in response to human-caused and other pressures. The changes have far-reaching consequences including impact on commercial development of certain species of plants and microorganisms--for use directly by humans for food (such as disease-resistant crop strains), drugs, and chemical compounds; and indirectly, through genetic applications and chemical transformations.

For these reasons, we urge you to support the President's proposed funding increases for the BBSS and its life science subactivities. Sound investment in these areas will support advances in disciplines ranging from agriculture to medicine in the near future. In turn, such applications directly influence our nation's ability to compete on the world market.

The Administration's proposal for significant growth in federal funding for NSF extends beyond FY 88, culminating in a doubling of the Foundation's budget by 1992. We heartily support this commitment as well. Already NSF is exploring programs which will carry these budgetary themes beyond this year. Such an approach is necessary if short-term gains are to be converted into long-term benefits. AIBS urges you to support the President's budget request for NSF, as an appropriate investment in our Nation's future. We believe that the initiative to strengthen basic research and science education as a means of increasing our technological superiority and bolstering economic competitiveness is a sound one, and worthy of your active support.

AIBS hopes that you will feel free to call upon the Institute if we can provide you with more specific details on this matter of national importance.

STATEMENT OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

On behalf of the American Psychological Association, I am pleased to submit our views on appropriations for the National Science Foundation (NSF) for Fiscal Year 1988. APA represents the concerns of more than 87,000 psychologists, many of whom conduct important scientific research with the support of NSF.

In this statement we address specific areas in the Administration's request for FY 1988 appropriations for existing programs and activities and new initiatives within NSF. We also comment on funding proposals of particular concern to behavioral and social scientists.

NSF APPROPRIATIONS FOR FISCAL YEAR 1988

APA appreciates this opportunity to strongly endorse the Administration's proposal to increase the National Science Foundation budget by 16.5 percent for FY 1988 to a total of $1.89 billion. Moreover, we applaud the President and NSF Director Erich Bloch for their foresight in proposing that the NSF budget be doubled over the next five years to $3.2 billion in FY 1992. These proposed increases signify a commitment by this Administration to invest in basic scientific research as part of this nation's goal to become more competitive internationally. Such a commitment requires a long-term investment to rebuild our scientific base and to ensure ongoing support for innovative basic scientific research. We urge Congress to support enhanced basic scientific research, which provides the requisite foundation for improving economic growth, productivity and competitiveness, and we encourage the Subcommittee to approve the resources needed to accomplish this goal.

BEHAVIORAL AND SOCIAL SCIENCES

APA commends the Administration for its proposal to increase funding for Research and Related Activities by 16 percent to $1.64 billion. Of particular interest to APA, are the specific increases targeted for behavioral and social sciences research, adding $39.3 million to the Biological, Behavioral and Social Sciences (BBS) Directorate. However, funding for the Behavioral and Neural Sciences and the Social and Economic Sciences Divisions is still disproportionately below historical appropriations levels. Although the total NSF budget has been significantly increased over the past few years, spending in the area of behavioral and social sciences has actually diminished in relationship to other research areas. In FY 1980, 6.1 percent of NSF's Research and Related Activities budget was allocated for behavioral and social sciences research, and by FY 1988 it had decreased to only 4.1 percent. APA recommends that Congress target at least 5 percent of Research and Related Activities appropriation towards the behavioral and social sciences.

The behavioral and social sciences have a critical role to play in these efforts to revitalize the nation's economic and technological base. While our international competitors have been quick to recognize these contributions, increases in productivity that could be realized by modifying organizational structures, personnel policies and decision-making processes have too often been overlooked as critical areas for research in the United States.

While technological advances are important, behavioral and social science research can be even more important in developing new human, social and institutional approaches in revitalizing this nation's industrial base. A few examples follow:

- Basic research in the social and behavioral sciences plays a much clearer and more consequential role in American institutions and industry than is typically recognized. There is a certain irony in that the findings of this research are perceived by foreign countries to have great export value. For example, it is often suggested in our media that the current superior position occupied by the Japanese steel industry is intimately related to their development of the notion of quality control circles. These control circles rest on two major concepts: a statistically based system of quality control, and participative decision-making. The notion of participative decision-making rests very clearly on basic research in social psychology going back three or four decades.

- The management structure and processes of American industry are often based on straight-forward behavioral science research. This research includes studies of the relationship of morale and employee satisfaction to productivity, the effects of employee participation in decision-making on productivity, the nature of resistance to change of management practices, employee profit-sharing plans, and the relationship of styles of leadership to group productivity.

- A global study on the impact of organized programs designed to increase employee productivity in the workplace found that the average worker's productivity did, in fact, increase significantly (Guzzo, Jette and Katzell, Personnel Psychology, 1985, Sum. Vol., 38(2), 275-291). This study analyzed the findings of 100 separate studies covering 11 types of psychologically-based organizational interventions. Not all interventions were equally effective. The most powerful strategies, it was found, were in the areas of employee training and goal setting. Surprisingly, supplying employees with increased financial incentives did not reliably lead to increased productivity. The effects of worker incentive programs varied widely the study found, sounding a warning to those who depend solely on increasing compensation to boost productivity.

- The field of psychology has made great strides in understanding how to maximize productivity, through job-person matching, test validation, and utility analysis. The field is now addressing quality in one's work life, retraining for technological change, and the development of work values and attitudes. Related to these areas of "cutting-edge" psychology are new integrations which are occurring between experimental psychology and human factors research in studying and making recommendations about lighting conditions on roadways, risk-taking under conditions of a poor environment for operating vehicles of various sorts, the use of special instrument installations in aircraft cockpits, and the exploration of sound levels in human nurseries.

- The rapid development of information technology, including that involved in the computer sciences, e.g., parallel processing systems, will require major efforts to understand how individuals process and think about information. There is a convergence here of cognitive science and human factors research in the understanding of person-machine interactions.

- Behavioral and social sciences have contributed directly to management of the research and development process in other sciences. Existing literature has been directly related to the composition of research teams, the organizational structure of research organizations, and the relationship of R&D to other functions of a business firm, such as marketing. In some of the more innovative and productive American firms this knowledge is used routinely to guide research processes, often with direct increases in research productivity.

SCIENCE EDUCATION

APA is also concerned about the future of science education at the precollege, undergraduate, graduate and postdoctoral levels. We recognize that much improvement is needed in our nation's science education activities, and we endorse the House Science, Research and Technology Subcommittee's recommendation to increase funding for the Science and Engineering Education (SEE) Directorate by $35 million over and above the Administration's $115 million request. Increased funding in this area is especially critical to restore a priority to science education programs, which were drastically reduced in FY 1982 to $20.9 million. Without adequately trained scientists and engineers today, the benefits of scientific research will not be realized tomorrow. The importance of the education of our nation's future scientists is properly reflected in NSF's proposed budget.

Additionally, APA is pleased with the Administration's proposal to enhance overall spending for education and human resources activities throughout NSF by $91 million in the FY 1988 budget request. This increase would raise the total spent on precollege, undergraduate and graduate programs by nearly 50 percent. In keeping with NSF's effort to augment educational support for scientists and engineers, the Administration has proposed to increase spending levels for undergraduate programs by $38 million and graduate and postdoctoral programs and other related activities by nearly $53 million. APA is particularly supportive of efforts to increase research experiences at the undergraduate level, enabling psychology students greater opportunities to participate in behavioral science research projects supported by NSF.

NEW INITIATIVES

The benefits of a multidisciplinary approach to advance knowledge and stimulate scientific innovation have been well demonstrated. In order to accelerate scientific advances to improve our nation's competitive posture, the FY 1988 NSF budget invests significant resources in new science and technology centers. These new multidisciplinary centers will include several centers in the behavioral and social sciences. APA supports the establishment of these new science centers which will expand research in important areas of psychological and social science research. For example, the proposed neurobiology centers will provide research support for the many aspects of learning, memory and cognition.

The neurobiology of learning and memory is fast becoming one of the most active and promising research areas within brain sciences today. For example, important research is being conducted on the disorders of learning and memory, which will form the basis for understanding such illnesses as Parkinson's disease and Alzheimer's disease.

Examples of research on Alzheimer's disease include investigations of the role of catecholamines and neuropeptides as well as cholinergic neurotoxicity in producing Alzheimer-related symptoms. These investigations, in part, have been stimulated by findings that Alzheimer's disease is associated with decreased cholinergic activity which in turn has led to an appreciation of the chemical basis of learning and memory, i.e., how neurotransmitters are involved in learning and memory. Since such studies involve both neurochemistry and behavior, only multidisciplinary research teams can produce the needed studies. Other research has indicated that cortical neurons are the site of pathogenesis in Alzheimer's disease. Furthermore, new drug therapies are being developed for the disease that are based on our understanding of the neural systems that subserve learning and memory.

Given the enormous complexity in conceptualizing the multiple issues and influences related to learning and memory and the neurological processes, APA supports the multidisciplinary center concept, as well as the NSF proposal to expand support for small multidisciplinary research group awards, to facilitate answers to the complex questions on learning and memory.

APA also supports the NSF proposal to develop the National Geographic Information and Analysis Center, which will seek to provide answers to important social and environmental questions based on geographical analysis and spatial statistics.

While APA is encouraged by these initiatives to establish and support new centers in the behavioral and social sciences, we are very concerned about continued support for field-initiated research at NSF. Expanded support for these centers must not drain needed resources from independent-investigator research, which has been the foundation of innovative basic scientific research at NSF. This is particularly important, now that the nation seeks to rebuild economic productivity at home and abroad. APA recommends that support for field-initiated research be maintained and enhanced as funding and resources with NSF are increased.

APA appreciates the Subcommittee's consideration of our comments and recommendations during its deliberations on FY 1988 appropriations for NSF. We strongly believe that behavioral and social science research makes important contributions to the goal of becoming internationally competitive. We commend the Administration for its vision and its conviction that NSF has a major role in supporting basic science and technology. We urge Congress to approve proposed spending increases and program initiatives for NSF in FY 1988.

STATEMENT OF THE AMERICAN GEOPHYSICAL UNION

Mr. Chairman and Committee members, my name is Peter S. Eagleson. I am President of the American Geophysical Union. AGU embraces the study of the earth, the planets, and their environment in space and is dedicated to the ideal of unselfish cooperation in research. It is a strong and rapidly expanding organization of more than 20,000 members who are research scientists, professors, students, administrators, engineers and laymen.

For all but the space sciences, the National Science Foundation traditionally funds the bulk of basic geophysical research in this country. In order to bolster the U.S.'s economic competitiveness and to maintain its lead in science and technology on an international level, it is essential for Congress to support the Administration's commitment to seek increases that would double NSF's budget over the next five years. The proposed 16.6% increase for FY88 is a good start towards a renewed emphasis on basic research and support for universities nationwide--support that is crucial for geophysics to meet future U.S. needs and the expectations of the American people.

Geophysics is a generic term which covers atmosphere, earth, ocean and space sciences. It is a truly international science that offers large-scale challenges and corresponding opportunities. It embraces both basic and applied science with consequent appeal to both theorists and pragmatists.

The needs of geophysics are as expansive and expensive as its scope. Probing the planets and the sun, the bottom of the ocean and the core of the earth, conducting synoptic studies of the ocean, the atmosphere and the near space environment all require an extensive and sustained commitment of financial, technological and human resources. To obtain these resources multifaceted support is needed. This requires a widespread understanding of the benefits of geophysical research to society. The sense of excitement, promise and even urgency surrounding new discoveries need to be transmitted to you and other legislative and policy-making bodies.

The excitement of science grows readily from new and wondrous views of nature. By punching holes in the heavens the telescope has revealed the enormity of the universe thereby capturing the imagination and support of the public for astronomy. At the other extreme, through revelation of the structure of matter, the microscope and accelerator have served the same purpose for materials science, molecular biology, and atomic physics.

The excitement and unity of geophysics is now vividly transmitted by views of our living, changing planet from space platforms. This perspective has spawned multidisciplinary efforts to describe and understand the interactive functioning and continuing evolution of Earth's component parts. Such efforts are not restricted to the more visible dynamics of the atmosphere and oceans but include as well the solid earth and Earth's environment in space.

The promise of geophysics arises because many basic geophysical studies are directly related to important societal problems and/or natural catastrophic events that have significant human impacts. Geophysicists first try to understand natural processes and then try to use this knowledge for prediction. This leads both to further scientific understanding and to the capability of mitigating natural hazards. The capacity for forecasting in the geophysical sciences gives political entities the time for strategic planning and/or emergency action to alleviate natural and anthropogenic cataclysms. The following are some familiar examples of geophysical research results leading directly to important public benefits:

. Determination of the size and recharge rates of underground reservoirs in the Southeastern U.S. by hydrologists is leading to legal and policy changes that will modify water use patterns and thus preserve options for future economic growth.

. Growing understanding by hydrologists of the rates of movement and decay of groundwater pollutants; is bringing legislation providing for the cleanup of past misuse; is providing scientific backup for expert testimony in tort actions and; is guiding the continuing search for safe waste disposal sites.

. Knowledge of upper atmosphere motions and their relationships to the movement of surface storms has amplified the accuracy and lead time of forecasts by meteorologists of severe storms such as hurricanes and tornadoes. This has led to significant reduction in the loss of lives and property.

. Global-scale observations of surface temperatures, pressure and precipitation distributions by atmospheric and oceanographic scientists have brought empirical recognition of so-called "teleconnections" or relationships between surface conditions at widely separated locations on the globe. Correlations between such conditions as sea surface temperature in the tropical Pacific Ocean and subsequent precipitation patterns in the continental U.S. (i.e., El Nino) are leading to much improved long-range weather forecasting. It is generally agreed that the key to great progress in such forecasting lies in deeper physical understanding of these linkages--a task which demands large-scale oceanographic and atmospheric observational programs in conjunction with satellite-borne sensors and sophisticated computer models of the global system. The payoff here is in better advanced planning for agriculture and for water and energy needs.

Understanding the ionized plasmas which occur naturally in the vicinity of geostationery orbits, one of the successes of the science of solar planetary relationships, has allowed our communication and monitoring satellites to be designed for dependable operations.

These satellites have, in turn, revolutionized the science of geodesy by making possible, using laser ranging, precise positioning on the earth's surface which has led to spatial characterization of crustal deformation and instantaneous plate tectonic motions and, using radar techniques, precise sea surface height measurements on a global scale.

The urgency of much geophysical research arises as in other sciences because problem recognition often drives the science. Two examples of current concern are:

. GLOBAL WARMING - Carbon dioxide and other trace gas levels in the atmosphere are increasing due to fossil fuel burning and other human activities. Because these gases are absorbers of infra-red radiation, energy in these long wave lengths is impeded from being radiated by the earth to outer space, resulting in general warming of the entire earth. A rise in average atmospheric temperature of about 0.5°C has been reported over the last one hundred years and the rise is expected to continue. The likely effects of this increase, e.g., glacial ice melting with rising sea level and shifting climatic zones, have not been confirmed as yet. It is imperative that atmospheric geophysicists refine their models and predictive capability so that proper planning and resource allocation can be made to minimize the effect of the expected coastal flooding and regional climate changes.

. OZONE DEPLETION - Just as some man-derived trace gases may induce global warming others such as the chloroflurocarbons (freons) may, by destruction of ultra-violet absorbing ozone in the upper atmosphere, cause an increase in the amount of ultra-violet (UV) radiation reaching the lower atmosphere. These increased levels of UV at the earth's surface will most certainly have serious ramifications. Among these are a greater incidence of human skin cancers and increased levels of hydrogen peroxide, the major irritant in smog, and a link in acid rain production. Atmospheric geophysicists are conducting research to confirm these causal relationships and are developing models which will provide reliable predictions that will compel nations to regulate the release of ozone destroying chemicals.

I have chosen these examples from the fluid geophysical sciences because the air and water play such a recognizable role in everyone's life. It is accepted now, however, that in our search for basic principles of environmental behavior we must connect our studies of the atmosphere, oceans and fresh waters with comparable investigations of the earth's surface and its interior, and with how earth communicates with the sun.

Two of the more visible problems from the solid earth sciences are:

... EARTHQUAKES AND UNDERGROUND NUCLEAR TESTS - The violent natural shifting that takes place deep within the earth and underground nuclear explosions which are detonated relatively near the surface generate vibrations that travel as seismic waves through and along the surface of the earth. The science of seismology, one of the disciplines of geophysics, is devoted to studying these waves and the information that can be derived from them. From the natural point of view, seismologists are able to pinpoint the location and magnitude of earthquakes and thereby gain much information about deep-earth dynamics. This information in conjunction with that generated by the tectonophysicists (another subset of geophysicists) on the composition, structure and evolution of the earth's crust is providing geophysicists with the capability of predicting the locations and magnitude of future earthquakes. Further developments in predicting the timing of such events will lead to great savings in lives and property.

One important result of the study of earthquakes is that seismologists are now able to routinely detect underground nuclear tests of about 10 kilotons (about the size of the Hiroshima bomb) with existing seismic networks outside the USSR. Another network that is being established by the National Resources Defense Council within the USSR in the vicinity of its underground testing site will be able to detect any tests down to below 1 kiloton at that site. Also, it has been shown that seismic data can be used to deduce the yields of Soviet weapons which, in turn, allows more accurate assessment of the strategic strength of the USSR. These capabilities have tremendous implications for test ban and arms limitations treaties.

.... VOLCANIC ERUPTIONS - Recent eruptions such as the Mt. St. Helens event in the U.S. in 1980 and El Chichon in Mexico in 1982 have resulted in mass destruction and considerable loss of life. Solid earth geophysicists through an increased understanding of these phenomena are now able to give some warning of an impending eruption, provided that the site is being continuously monitored for seismicity and other manifestations of magmatic activity.

We must continue to remember that the research of highest ultimate value is often that done originally for the sake of knowledge alone without the imperative of a recognized problem. Also, some of the geophysical problems which are recognized are a generation or two away from capturing the public interest (global change is an example) yet because the lead time for their scientific understanding is of comparable length work must be started now.

For these reasons we must maintain a continuing drive for fundamental understanding of how the earth system works.

Experimentation is basic to scientific advance and while we can't easily manipulate the earth system to study its response to change, we can observe the response to the natural daily and seasonal changes. Furthermore, through geochemistry and petrology we can reconstruct many of the environmental changes that accompanied earth's evolution. The study of other planets contributes significantly to our general understanding of planetary systems.

These examples highlight only the most recognizable of geophysical research efforts. The spectrum of these activities reaches from the solid earth (geodesy, geomagnetism and paleomagnetism, seismology, tectonophysics, volcanology, geochemistry and petrology) through the fluid earth (atmospheric sciences, ocean sciences and hydrology) and out to space (solar-planetary relationships and planetology). Because the problems have a wide range of time and space scales, the data volume is large and the need for better systems of data management is accute. Solutions to these geophysical problems require continued strong support for basic research by various federal agencies. On behalf of my colleagues in the American Geophysical Union, I urge that you approve the proposed increase in the FY88 budget for the National Science Foundation.

LETTER FROM DR. JOSEPH A. SALOOM, CHAIRMAN, COUNCIL ON RESEARCH AND TECHNOLOGY

May 13, 1987

HAND DELIVERED

Honorable William Proxmire
Chairman
Subcommittee on HUD & Independent Agencies
Senate Appropriations Committee
142 Dirksen Building
Washington, D.C. 20510

Dear Mr. Chairman:

I am writing on behalf of the members of the Council on Research and Technology in support of increasing the National Science Foundation budget for FY 1988. Specifically, CORETECH's Board of Directors met on May 7, 1987, and voted unanimously to endorse the 17% increase in NSF's budget for FY 1988, requested by the Administration.

CORETECH was formed in February of this year to encourage a stronger national commitment to research and development. CORETECH is dedicated to supporting policies that will foster research across a wide spectrum of U.S. industrial sectors and research institutions. To date, 35 research-intensive corporations, 73 major universities, 5 research institutes, and 15 associations have joined. I am enclosing our current membership list.

We believe that increased NSF funding is an essential part of our national commitment to research and development and will serve to:

- Safeguard our national strength in basic research;
- Train needed scientists and engineers; and
- Enable new multidisciplinary approaches to cutting-edge research.

The United States has been the undisputed world leader in basic research, enabling us to achieve technological breakthroughs that have fueled economic growth for the past half century. Universities, where over half of all U.S. basic research is conducted, are the focus for preserving our lead in the critical fields of science and engineering.

However, in recent years, the proportion of U.S. R&D funds going to basic research has been shrinking. Further, the federal investment in university research facilities and equipment has declined by 95% in real terms over the past 20 years. We are no longer the world leader in the number of engineers and scientists per capita.

CORETECH's policy recommendation to increase NSF's budget rests on the belief that the competitive edge will go to those who can advance technology. Economists are now saying that as much as two-thirds of the productivity growth we have achieved since the Great Depression is attributable to innovation. Given the challenges we now face in global markets, we cannot afford to underinvest in the building blocks of innovation, research and development.

I would like to request that this letter be made part of the Record of the Subcommittee on HUD and Independent Agencies' hearings on the FY 1988 Appropriations Bill.

Thank you for considering this request. If I can be of any assistance, please do not hesitate to contact me at my company, M/A COM Components, Inc. at (617) 272-9600 ext. 1211, or through CORETECH at (202) 628-1700.

Sincerely,

Dr. Joseph A. Saloom
Chairman, CORETECH

Enclosure

The Council on Research and Technology
1735 New York Avenue, N.W. Suite 500
Washington, D.C. 20006
(As of 5/6/87)

COMPANIES (35)

Abbott Laboratories
American Cyanamid
AMP, Inc.
Analog Devices, Inc.
Apple Computer, Inc.
AT & T
Control Data Corporation
Cray Research
Digital Equipment
Du Pont
Howmet Turbine Components
Hewlett-Packard
IBM
Intel Corporation
Intermec Corporation
John Fluke Mfg. Company
Johnson & Johnson
M/A COM, Inc.
Medtronic, Inc.
Merck & Co.
Motorola
NCR Corporation
Pfizer, Inc.
Procter & Gamble
Raychem Corporation
Sandoz Pharmaceuticals
Schering-Plough
The Singer Company
Squibb Corporation
Tektronix, Inc.
UNISYS, Inc.
Upjohn
US WEST, Inc.
Varian Associates
Warner-Lambert

UNIVERSITIES (73)

Arizona Board of Regents
Brandeis University
Brown University
California Institute of Technology
Carnegie-Mellon
City Univ. of New York Research Foundation
Clemson University
Cornell University
Dartmouth College
Duke University
Emory University
Georgia Institute of Technology
Harvard University
Indiana University
Iowa State University
Kansas State University
Lehigh University
Massachusetts Institute of Technology
New Mexico State Univ.
New York University
North Carolina State
Northwestern University
Oregon Ctr. for Advanced Technology Education
Oregon Graduate Center
Penn State University
Princeton University
Purdue University
Rice University
Rensselaer Polytechnic
Rutgers University
Southern Illinois Univ.
Stanford University
State Univ. of New York at Buffalo
State Univ. of New York at Stony Brook
Syracuse University
Tulane University
University of Alabama Birmingham
University of Alabama System
University of Arizona
Univ. of California at Berkeley
University of California System
University of Chicago
University of Cincinnati
University of Connecticut
University of Delaware
University of Florida
University of Hawaii
University of Houston
University of Illinois
University of Iowa
University of Kentucky
University of Louisville
University of Maine at Orono
University of Michigan
University of Minnesota
University of Mississippi
University of Missouri Kansas City
University of Nebraska
University of N. Carolina Chapel Hill
University of N. Carolina General Administration
University of Oklahoma
University of Pennsylvania
University of S. Carolina
Univ. Southern California
University of Tennessee
University of Texas
University of Washington
Utah State University
Virginia Commonwealth Univ.
Virginia Tech
Washington State Univ.
Washington University
Wayne State University

PUBLIC AND PRIVATE ASSOCIATIONS (15)

ADAPSO, Inc.
Association of American Universities (AAU)
American Electronics Association (AEA)
Association of Independent Research Institutes(AIRI)
Computer Business Equipment Manufact. Assn. (CBEMA)
Electronic Industry Association (EIA)
Kansas Technology Enterprise Corporation
Motor Vehicle Manufacturers Association (MVMA)
NASULGC
National Machine Tool Builders Association
National Printing and Equipment Supplies Assn.
Pharmaceutical Manufacturer Association (PMA)
Scientific Apparatus Makers Association (SAMA)
Semiconductor Industry Association (SIA)
Southeastern Universities Research Assn. (SURA)

RESEARCH INSTITUTES (5)

IIT Research Institute
Houston Area Research Ctr.
Microelectronics & Computer Technology Corporation
Nat. Biomedical Research Foundation, Inc.
Research Triangle Institute

AFFILIATES (6)

American Society for Engineering Education
Council on Competitiveness
New England Council
TRW Corporation
Ohio University
University of Rhode Island

VETERANS ADMINISTRATION

STATEMENT OF DR. ROBERT PETERSDORF, PRESIDENT, ASSOCIATION OF AMERICAN MEDICAL COLLEGES

DEPARTMENT OF MEDICINE AND SURGERY

Senator LAUTENBERG. Dr. Petersdorf is the next to testify.

Dr. PETERSDORF. My name is Robert G. Petersdorf, and I am the president of the Association of American Medical Colleges. I am pleased to have the opportunity to present the views of the Association of Medical Colleges on the fiscal year 1988 appropriation for the Veterans Administration Department of Medicine and Surgery.

The AMC is closely related to the VA hospitals of our 127 accredited medical schools and their students, and the hospitals are part of our organization.

On behalf of the AMC, I want to thank the subcommittee for its past support of the DM&S budget. The association would also like to cite the efforts of the four veterans service organizations in formulating the independent health care budget.

In general, we believe that the fiscal year 1988 budget proposal for the VA submitted by the administration cuts many needed programs below what is required to maintain services, even at their present level. These areas fall into three parts:

MEDICAL CARE BUDGET

First, the amount that has been requested in the President's budget for medical care; that is, $9.967 billion does represent an increase of $414 million over fiscal year 1987, but it is $250 million short of the Congressional Budget Office current estimate of $10.21 billion. This proposal also calls for the reduction in health care professionals and reduces that number by nearly 2,000. If such arbitrary reductions are permitted to continue until fiscal year 1991, as the administration has proposed, the result will be a total loss of over 10,000 FTE's. So we recommend that the VA medical care accounts be funded in fiscal year 1988 at no less than $10.338 billion, which would provide for current services with small increases in needed programs.

EDUCATION AND TRAINING

The second arena where we would like to comment deals with the education and training of the VA facilities. The proposal by the administration is that this be increased by $9 million, and this would permit only a single FTE—$8.6 million. We would like to request that an additional $9 million be provided, so that 200 new house staff positions be created which would provide assistance, particularly in this era of technological medicine in which we live.

We also would like to add that the number of Geriatric Research, Education and Clinical Centers, GRECC's, be increased from 10 to 13. As we all get older, the VA will have a much older share of veterans, and I think that is important.

Finally, we want to ask for modest increases for medical and prosthetic research.

In conclusion, then, many Americans—directly or indirectly—are affected by and rely on the high quality of medical care provided by the VA, and it seems essential that funding be made available for adequate numbers of health professionals, a vigorous research program, and construction and acquisition of modern facilities and equipment.

The AMC asks that the subcommittee approve an fiscal year 1988 appropriation that, once again, reflects its continued commitments to the nation's veterans.

Thank you, Mr. Chairman.

Senator LAUTENBERG. Thank you very much, Dr. Petersdorf.

[The statement follows:]

STATEMENT OF DR. ROBERT G. PETERSDORF, PRESIDENT, ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The Association of American Medical Colleges (AAMC) appreciates having the opportunity to present its views on the fiscal year (FY) 1988 appropriation for the medical care, research, and construction programs of the Veterans Administration (VA). Since the organization's founding over 100 years ago, the AAMC has grown to represent the entire spectrum of our medical education enterprise -- institutions of both education and health care, faculty organizations, and undergraduate medical students. Today the Association serves as the national spokesperson for 127 accredited medical schools and their students, 85 academic and professional societies, and 435 major teaching hospitals, including over 70 VA medical centers.

The ties between AAMC-member institutions and the VA have been and continue to be strong; currently, there are affiliation agreements in place between 101 medical schools and 133 of the VA's 172 medical centers. The affiliated medical schools have responsibility for conducting the residency training programs for VA physicians; as such, the majority of the senior professional staff of most VA hospitals have been both recruited by and are faculty members of the affiliated medical school. The AAMC views this as a mutually beneficial arrangement for both the medical schools and VA hospitals. The academic atmosphere created by the affiliation assists the VA in recruiting highly qualified professionals, and the medical schools have access to important resources, valuable to their educational mission. Jointly, the two entities conduct vital research programs and provide for the delivery of health care services in areas of specific importance to the veterans population. However, given the broad spectrum of medical conditions prevalent in the veteran community, the results of VA research also have considerable applicability to the population at large. Thus, our nation can look forward to better quality health care as a result of the VA-medical school partnership.

All parties interested in the continuation of the high level of excellence of the VA medical care system, and its research and education programs, recognize the need for fiscal responsibility at this time of record federal budget deficits. However, the FY 1988 budget proposal for the VA submitted by the Administration goes beyond the need for budgetary restraint, and cuts many needed programs below what is needed to maintain services even at their present levels. The AAMC feels strongly that our nation's veterans -- of whom an increasing number are elderly and indigent -- should not be slated for undue hardships in efforts to reduce the federal budget deficit. We believe that VA medical programs should be among the highest priority claimants on the federal budget, funded at a level enabling them to remain responsive to the growing demand for VA health care services.

Before commenting on specific areas of the VA's Department of Medicine and Surgery budget, the AAMC would like to thank this Subcommittee for its past support of the VA medical and research enterprise. The Association would also like to favorably cite the efforts of the four veterans' service organizations in developing the "Independent Health Care Budget." It marks the first time such a joint effort has been undertaken, and represents a valuable resource to policy makers in the formulation of a VA medical care, education, and research budget.

Medical Care

Although the Association is encouraged that the Administration's budget request for VA medical care exceeds last year's appropriation, we are also discouraged that it nevertheless falls short of the amount necessary to provide current services in the coming fiscal year. For FY 1988, the Administration has requested $9.967 billion in budget authority, an increase of $414 million over the FY 1987 appropriated amount, but almost $250 million short of the Congressional Budget Office current service estimate of $10.21 billion. In addition, despite the increase in budget authority, the proposal calls for reductions in the number of health care professionals and employees, through both budgetary and programmatic alterations. For example, a one percent "productivity increase" has been proposed, arbitrarily reducing funding by almost $59 million and the number of full-time-employee-equivalents (FTEE) by 1,911. If such reductions were to continue unabated until FY 1991, as the Administration has proposed in past years, the result would be a total loss of over 10,000 FTEEs. At a time when demand for VA medical care is -- and is expected to continue to be -- on the rise, it does not seem rational to reduce the health care personnel needed to deliver such care.

The Association recommends that the VA medical care accounts be funded in FY 1988 at no less than $10.338 billion. This level is prudent because it would provide funds for the VA to meet the current demands of the veterans population, plus provide a small amount of funds for new ventures required to care for the aging VA medical care patients.

Education and Training

Included in the medical care appropriation are the costs of the education and training programs conducted in VA facilities. The Administration has proposed funding of $234.5 million in FY 1988 for the medical education and training programs, an increase of $8.6 million over FY 1987. However, the Administration has also proposed only a single additional FTEE for the medical residency training program; a large share of the increase is slated for pay and retirement fund enhancements. The VA's education and training programs are both a major factor in maintaining high quality patient care, and a major component of our nation's health professions training program. Therefore, the Association recommends that the President's requested level be increased by $9 million to approximately $245 million, as called for in the Independent Health Care Budget. This would fund approximately 200 new housestaff positions, provide assistance for current staff, and render the VA more attractive as a career choice for physicians and clinical researchers through the promise of a growing educational program. We feel this increase would not add to the total number of physicians in this country. Rather, we expect that increasing the numbers of housestaff programs would merely lead to a shift in training slots from other affiliated hospitals to the VA.

The Association also feels strongly that the number of Geriatric Research, Education and Clinical Centers (GRECC) be increased from 10 to 13. These centers are designed to advance geriatric and gerontological research and education in a clinical setting, and to assist in the intergration of geriatric care into the total VA system. An expanded GRECC program would not only help the VA medical care system maintain its leadership role in dealing with the problems of the aging, but will also foster new approaches to care. The President's FY 1988 budget proposal contains no funds for new GRECCs, even though Public Law 99-166 mandated that the number be increased to 25. The AAMC supported this target, and urges that a first step be taken now.

The AAMC also recommends that funding for continuing education programs for VA health care personnel be increased over the amount provided in FY 1987. In this era of rapid changes in medical techniques and technologies, it is critical for physicians and other health professionals to be able to provide care incorporating the most recent advances in the treatment of illness.

Medical and Prosthetic Research

The research conducted by the VA complements the medical care and education components of the effort to improve and maintain the quality of health care provided to our veterans. Its reputation is well established in the areas of biomedical, behavioral, rehabilitative, and health services research, all of which are focused on the medical problems that characterize the veterans population. In addicion, the nature of VA research efforts requires the VA to have the ability to coordinate clinical research on a broad range of patients at multiple sites, the fruits of which have made valuable contributions to the evaluation of new treatment approaches and delivery modalities.

Despite the importance of this program, the Administration has again failed to budget adequate resources to meet the VA's research needs and opportunities. For fiscal year 1988, the Administration has proposed budget authority of $198.8 million. If the one-time transfer of $20 million from the Department of Defense (DoD) is discounted from the current (1987) fiscal year's budget authority, the level proposed by the President for next year represents an increase of approximately $6 million, or three percent -- far below the 12 percent increase proposed for research and development at the DoD. Moreover, virtually all of this increase would be absorbed by activities outside of basic, investigator-initiated research -- pay raises, contributions to the new federal retirement fund, and directed or transferred research projects. In fact, the proposed funding levels would terminate support for 225 FTEEs, clear evidence that the Administration's proposal cannot maintain current service levels.

The proposed budget for VA research is particularly distressful because the story of VA research is one of shining achievement: the antibiotic cure for tuberculosis, the modern treatment of hypertension, the first cardiac pacemaker, and the first liver transplant. Thousands of individuals outside the veterans population have lived better lives as a result of VA-supported research.

Like the VA's education and medical care programs, the unique clinician/investigator-based research effort is an invaluable national resource and should be adequately supported and maintained. Therefore, AAMC urges that the Subcommittee provide not less than $226 million in FY 1988 for investigator-initiated and intramural VA cooperative research only. Excluded from our recommended appropriation are all transferred funds, new initiatives, and directed research. Funding at the recommended level would allow the VA to maintain current services in the coming fiscal year and correct for the aberrational effects of the Gramm-Rudman-Hollings (GRH) law on the VA research budget. Since the VA research budget was reduced by both Congressional action and the GRH sequestration process in FY 1986 (thereby skewing the FY 1987 current service estimate), it is necessary to return to FY 1985 appropriation levels to form a realistic base for calculating current services for the coming fiscal year. The AAMC recommendation of $226 million should allow the VA to fully fund all peer review approved research grants next year up to a priority score of 35 -- appproximately the same level as FY 1985. Appropriations of this magnitude would allow the VA to preserve the high calibre of research being conducted in the medical and prosthetic research program, and to remain a strong participant in biomedical research revolution to which it has contributed greatly.

Construction

In order to deliver the highest quality health care, the VA must have access to modern facilities and equipment. The Administration has proposed increases in budget authority in both the VA's major and minor construction accounts. The Association supports this effort and urges the Subcommittee to appropriate at levels no lower than those asked for by the Administration. However, it must be noted that these funding proposals still fall short of the amounts provided in fiscal year 1985.

In a 1984 report entitled "Caring for the Older Veteran," the VA projected that, in order to meet the needs of the 1990 veterans population, hospital beds would have to be increased by 140 percent. Further, during the five years 1995-2000, long-term care beds would have to virtually double. Given such estimates for future bed needs, sufficient funding must be provided for replacement and modernization of outmoded VA medical facilities.

Conclusion

A great majority of Americans, directly or indirectly are affected by and rely on the medical care provided by the VA. Therefore, it is incumbent that funding be made available for adequate numbers of health professionals, a vigorous research program, and construction and acquisition of modern facilities and equipment. This Subcommittee has consistantly made such funds available to the VA. The AAMC askes that it approve an FY 1988 appropriation that will reflect its continued commitment to an especially deserving population.

FEDERAL EMERGENCY MANAGEMENT AGENCY

STATEMENT OF EDWINA K. HARMON, PRESIDENT, NATIONAL COORDINATING COUNCIL ON EMERGENCY MANAGEMENT

CIVIL DEFENSE

Senator LAUTENBERG. I would call on Mrs. Harmon now, please.

Mrs. HARMON. Thank you, Mr. Chairman.

I am Kay Harmon, president of the National Coordinating Council on Emergency Management, and on behalf of the association I wish to thank you for the opportunity to discuss that portion of the Federal Emergency Management Agency fiscal year 1988 budget request which deals with those programs categorized as civil defense.

The present emergency management system relies upon a partnership of federal, state, and local governments, as well as the public and private sector to provide for the protection of public health and safety. A very viable demonstration of that partnership has been the panel testimony for the past 3 years by our organization and the National Emergency Management Association.

I am pleased to join once again in this endeavor with Mr. James Maher, the president of NEMA, whose statement will encompass many of our concerns.

NCCEM believes two specific program categories contained within the civil defense portion of FEMA's budget must be emphasized. They are identified as state and local emergency management assistance, and training and education. These two program elements have the greatest impact at the local level, as emergency management assistance is the only pass-through money, and training and education dollars fund the student stipend program for those local participants who attend the Emergency Management Institute.

Local communities presently are supporting a significant level of emergency preparedness capability as a part of the federal-state-local infrastructure. Estimates indicate that a majority of local jurisdictions fund approximately 70 to 80 percent of their emergency management program, including those resources identified as civil defense.

FISCAL YEAR 1988 BUDGET AMENDMENT

FEMA has indicated in the highlights of the fiscal year 1988 budget amendment for Civil Defense that, "The revised program to implement the national security decision directive is designed to support the state and local emergency management infrastructure." Noticeably absent in that $20 million request are any funds allocated for local government, although it is readily apparent that there will be an ever-increasing workload for local emergency managers. Program areas such as volunteerism and public education will of necessity have to be implemented at the local level. If the amendment to the fiscal year 1988 budget is designed to support state and local infrastructure, then why does the amendment not reflect an increase in that portion of the budget that has remained straight-lined for the past 3 years, the emergency management assistance?

We would like to emphasize our support of Mr. Maher's testimony where he states, "While overall civil defense funding declines $4.6 million, the Federal Preparedness Program is increased by $30 million. Similarly, the reduction in the Training and Fire Program, 4.7 percent, almost balances the increase in management and administration, 5.5 percent."

TRAINING AND EDUCATION REDUCTION

Additionally, FEMA's budget request once again contains a proposed reduction in Training and Education dollars. It is essential to emphasize that the training and education courses conducted by FEMA not only benefit an individual but a multitude of people through interaction and training of emergency response personnel.

Surveys have indicated that less than 10 percent of the student potential would be able to avail themselves of the educational opportunities at EMI if the program is eliminated.

Nowhere in the educational community does there exist an emergency management curriculum such as the Training and Education Program offered through FEMA. It alone serves as the graduate level educational format for those individuals involved in emergency management.

In conclusion, let me reiterate that it is our belief that if Congress fails to provide the resources necessary to sustain emergency management programs, significantly greater costs will be incurred in recovery efforts. Through mitigation and preparedness, lives can be saved and damages to property reduced.

Emergency managers across this nation ask your assistance in achieving this goal.

Thank you, Mr. Chairman. Mrs. Lewis and I would be happy to respond to any questions of the committee.

Senator LAUTENBERG. Thank you very much.

[The statement follows:]

STATEMENT OF EDWINA KAY HARMON, PRESIDENT, NATIONAL COORDINATING COUNCIL ON EMERGENCY MANAGEMENT

SUMMARY

Program: Federal Emergency Management Agency FY 1988 Civil Defense budget request, as amended.

- -Emergency Management Assistance (EMA)
- -Student Stipend Program
- -$20 million amendment
- -Balance of budget request

Specific Actions: The National Coordinating Council on Emergency Management recommends:

1. Emergency Management Assistance (EMA) dollars be restricted to line item and not authorized for transfers to other program areas or the implementation of the National Security Directive Decision.

2. Student stipend program not be eliminated, reduced, or phased out in this budget or in future years.

3. The $20 million amendment be designated for the state and local EMA program, plus the $1.542 million for strengthening the Radiological Defense, Instrument Maintenance Program and providing Radiological Defense Officers in all states.

The National Coordinating Council on Emergency Management supports the National Emergency Management Association on the balance of the FEMA FY 1988 budget request.

Mr. Chairman and members of the Subcommittee, on behalf of the National Coordinating Council on Emergency Management (NCCEM) thank you for the opportunity to discuss that portion of the Federal Emergency Management Agency (FEMA) FY 1988 budget request which deals with those programs categorized as "Civil Defense".

The National Coordinating Council on Emergency Management, established since 1952 and formerly known as the United States Civil Defense Council, is a nation wide, non-profit association representing the public interest in the realm of local government emergency preparedness. The membership of NCCEM, for the most part, consists of local emergency managers and civil defense directors, whose role is saving lives and reducing property damage from the effects of disasters.

Through the years our association has also come to include within its membership other professional and technical personnel who work on a daily basis in the emergency management field.

The present emergency management system relies upon a partnership of federal, state and local governments, as well as the public and private sector, to provide for the protection of public health and safety. This partnership has enabled the building and maintenance of an infrastructure designed to prepare for, respond to, recover from and mitigate a multitude of hazards. Utilization of the all-risk concept has allowed communities to better prepare for any eventuality.

A very viable demonstration of that partnership has been the panel testimony for the past three (3) years by our organization and the National Emergency Management Association (NEMA). I am pleased to once again join in this endeavor with Mr. James Maher, the President of NEMA, whose statement encompasses many of our concerns.

The National Coordinating Council on Emergency Management believes two specific program categories, contained within the Civil Defense portion of FEMA's budget, must be emphasized. They are identified as State and Local Emergency Management Assistance (EMA) and Training and Education. These two program elements have the greatest impact at the local level as emergency management assistance is the only "pass through" money and Training and Education dollars fund the student stipend program for those local participants who attend the Emergency Management Institute.

Local communities presently are supporting a significant level of emergency preparedness capability as a part of the federal-state-local infrastructure. Estimates indicate that a majority of local jurisdictions fund approximately 70 to 80 percent of their emergency management program, including those resources identified as "Civil Defense".

One of the concerns of NCCEM is that any reduction in Emergency Management Assistance dollars (through budget cuts or in transfers from state and local EMA funds to other program areas) will result in a deterioration of this nation's capability to provide adequate protection for its populace.

Please allow me to cite two specific local programs:

1) A small rural county in the Midwest appropriates a budget of $36,000 and receives $13,000 in EMA reimbursement.

2) A metropolitan area community with a population of 124,000 receives $32,000 in EMA reimbursement out of a budget of $93,000 which does not reflect some $13,000 expended to improve communication capabilities in the emergency operating center.

For the investments of $13,000 and $32,000, respectively, the federal government receives, in each case, staff people trained and knowledgeable in emergency management; warning and communication capability; comprehensive emergency plans developed and maintained; radiological equipment maintained for nuclear incidents, be they peacetime or attack related; and a network of emergency response personnel who know and understand the complexities of their community. In order to meet the mandate of the Civil Defense Act of 1950 as amended, Emergency Management Assistance is essential. The local-state-federal infrastructure is dependent on this funding.

FEMA has indicated in the highlights of the fiscal year 1988 budget amendment for Civil Defense that "the revised program to implement the National Security Decision Directive is designed to support the State and Local emergency management infrastructure." Noticeably absent in the 20 million dollar request are any funds allocated for local government, although it is readily apparent that there will be an ever increasing work load for local emergency managers. Program areas such as volunteerism and public education will, of necessity, have to be implemented at the local level. If the amendment to the FY 1988 budget is designed to support the state and local infrastructure, then why does the amendment not reflect an increase in that portion of the budget that has remained straight-lined for the past three years--Emergency Management Assistance?

May we respectfully suggest that the infrastructure at the local and state level has been decimated almost to the point of no return. If a credible program is ever to resurface, strong emphases should first be directed to the strengthening of that area. A sizable increase in (EMA) would be the first small but significant step in the right direction.

We would like to emphasize our support of Mr. Maher's testimony where he states, "While overall (Civil Defense) funding declines $4.6 million dollars, the Federal Preparedness Program is increased by $30 million. Similarly, the reduction in the Training and Fire Program (4.7%) almost balances the increase in Management and Administration (5.5%)."

Additionally, FEMA's budget request once again contains a proposed reduction in Training and Education dollars as it relates to the student stipend, phasing out this program over a three-year time period. It is essential to emphasize that the training and education courses conducted by FEMA not only benefit an individual student but a multitude of people through interaction and training of emergency response personnel as well as volunteers at the local level.

While the Federal Emergency Management Agency has indicated that the reduction in the stipend program would result in cost sharing by state and local government in training their employees at the National Emergency Training Center, it should be pointed out that a financial commitment presently is made by a jurisdiction who sends a student to courses at FEMA's Emergency Management Institute (EMI). Local contributions include the cost of travel to and from airports, airport parking during the trip, meals while attending the course, the employee's salary and stand-by and/or overtime pay to cover the responsibilities of the employee while he is away from his community.

Surveys of participants in the student stipend program and emergency managers across the country have indicated that only a very small portion (less than 10%) of the student potential would be able to avail themselves of the educational opportunities at EMI if the program is eliminated. This investment in stipends seems to have great national benefit in lives saved and properties protected for a limited federal tax payer expense. Further, FEMA's new program language is using volunteerism as a cornerstone. Volunteers need educational opportunities and materials. No stipend and a shortsighted training program would seem to negate that effort. Volunteers -- firefighters, Red Cross, Salvation Army, Civil Air Patrol, Mennonite disaster services, and various radio amateurs -- play a significant role in FEMA's efforts. No stipends for resident training virtually would eliminate these people from the national training center. We do not think that this is very good for this country or your program. We are beginning to wonder if FEMA is trying to close or eliminate the National Emergency Training Center (NETC) and its two (2) schools, the Emergency Management Institute (EMI) and the National Fire Academy (NFA). Ultimately this will be the result if this reduction is implemented. Nowhere in the educational community does there exist an emergency management curriculum such as the Training and Education program offered through FEMA. It alone serves as the "graduate level" educational format for those individuals involved in emergency management.

In conclusion, let me reiterate that, while members of the National Coordinating Council on Emergency Management are fully cognizant of the federal deficit, it is our belief that if Congress fails to provide the resources necessary to sustain emergency management programs, significantly greater costs will be incurred in recovery efforts. Through mitigation and preparedness lives can be saved and damages to property reduced.

Emergency managers across this nation ask your assistance in achieving this goal which is so vital to our citizens.

Thank you, Mr. Chairman. We will be happy to respond to any questions.

STATEMENT OF JAMES E. MAHER, PRESIDENT, NATIONAL EMERGENCY MANAGEMENT ASSOCIATION

PRINCIPLES OF COMPREHENSIVE EMERGENCY MANAGEMENT PROMOTED

Senator LAUTENBERG. Mr. Maher?

Mr. MAHER. Thank you, Mr. Chairman.

I am Jim Maher. I am president of the National Emergency Management Association, which is an organization of the state directors of emergency management and others throughout the United States and the territories who actively promote the principles of comprehensive emergency management. We represent our Governors, and our constituents, of course, are all of the people of the United States.

Through the Federal Emergency Management Agency, the role of the federal government has primarily been one of fiscal support and program guidance to state and local governments. This support has enabled those organizations responsible for public safety to build and to maintain an infrastructure to coordinate the readiness for, response to, and recovery from the multitude of hazards which threaten their respective communities. This same infrastructure is also the mechanism through which disaster assistance, pursuant to Public Law 93-288, is provided following a declaration of an emergency or major disaster by the President. This same infrastructure coordinates the delivery of the disaster programs of other federal agencies and voluntary organizations, such as the Small Business Administration, the Department of Agriculture, the Corps of Engineers, and the Red Cross, just to name a few.

ALL COMMUNITIES VULNERABLE

The FEMA hazard identification process, in which more than 3,000 local governments have participated in the past several years, has substantiated the fact that no community in this country may be considered safe from any number of hazards which place significant populations at risk.

We have all become too familiar with the human suffering and property damage caused by natural phenomena such as flooding, landslides, hurricanes, and earthquakes. Our recent experience in Mississippi, where flooding and tornados claimed seven lives, injured scores, and caused millions of dollars in damage, reminds us of just how vulnerable we are.

More recent has been the flooding over wide areas of the Northeast, the Mid-Atlantic, and the midwestern states.

In calendar year 1986, 30 major disasters were declared by the President, with an obligation of more than $447 million in federal disaster assistance funds.

I might add that a large portion of that $447 million was matched with state and local funds.

In addition to those disasters caused by natural phenomena, government officials and the public have been increasingly aware and concerned about those hazards which result in our growing dependence on technology. Out of that concern has come title III, the Emergency Planning and Community Right-to-Know Act of 1986. I know that in New Jersey they are very aware of that. With a few pen strokes back in October, the President gave us another full-time job. No federal funding was provided for us to do that job. And to complicate matters, FEMA's stated policy with respect to implementing title III is that "the utilization of FEMA-funded personnel for other than short-term or supervisory roles is not appropriate." We feel that that is a very short-sighted position.

We are concerned that funding for the programs we have specifically identified will continue to be reduced to the benefit of the FEMA in-house programs. While it is not our place to determine that agency's priorities, we note that while programs which support state and local efforts are being reduced, FEMA in-house programs are increasing.

I am out of time, I know that, Mr. Chairman, and I will be happy to respond to any questions.

Senator LAUTENBERG. I am sorry. I am very involved in the writing of Superfund, the emergency response provisions, et cetera, and we would like to hear more from you, but unfortunately we are out of time.

This panel is excused. We thank you very much for your testimony. I promise to read every word of it in the record there, but I don't want any quizzes on it.

Thank you.

[The statement follows:]

STATEMENT OF JAMES E. MAHER, PRESIDENT, NATIONAL EMERGENCY MANAGEMENT ASSOCIATION

Mr. Chairman, members of the Committee, on behalf of the National Emergency Management Association (NEMA), thank you for the opportunity to present testimony on the Federal Emergency Management Agency (FEMA) FY 1988 budget request.

The National Emergency Management Association is an organization of State Directors of Emergency Management and others from throughout the United States and its territories, who actively promote the principles of Comprehensive Emergency Management (CEM). CEM seeks to improve the interaction on all elements of the public safety community into a cohesive infrastructure for the protection of the public against all hazards, man-made or natural.

From the earliest history of this country, the protection of the public health and safety has been a concern of and a basic function for all levels of government. Numerous acts of our collective legislative bodies attest to this concern. The present system which has evolved to achieve this worthwhile objective, relies upon a partnership among federal, state and local governments, as well as between the public and private sectors.

Through the Federal Emergency Management Agency, the role of the federal government has primarily been one of fiscal support and program guidance to State and local governments. This support has enabled those organizations reponsible for public safety to build and to maintain an infrastructure to coordinate the readiness for, response to, and recovery from the multitude of hazards which threaten their respective communities. This same infrastructure is also the administrative mechanism through which disaster assistance, pursuant to Public Law 93-288, the Disaster Relief Act of 1974 is provided following a declaration of an emergency or major disaster by the President. This same infrastructure coordinates the delivery of the disaster programs of other federal agencies and voluntary organizations, such as the Small Business Administration, the United States Department of Agriculture, and the United States Army Corps of Engineers, and the American Red Cross, to name a few.

The FEMA hazard identification process, in which more than 3,000 local governments have participated, has substantiated the fact that no community may be considered safe from any number of hazards which place significant populations at risk.

We have all become too familiar with the human suffering and property damage caused by natural phenomena such as flooding, landslides, hurricanes and earthquakes. Our recent experience in Mississippi where flooding and tornados claimed seven (7) lives, injured scores and caused millions of dollars in damage, reminds us of just how vulnerable we are.

In Calendar Year 1986, thirty major disasters were declared by the President with an obligation of more than $447 million in federal disaster assistance funds. While these numbers are significant in themselves, they do not begin to account for total damages, which are in the billions of dollars, nor for the thousands of incidents of a less catastrophic nature, which require a coordinated response by State and local emergency management officials across the nation - a response dependent, in large part, upon the resources provided through those programs labeled "Civil Defense."

In addition to those disasters caused by natural disaster, government officials and the public have become increasingly aware of and concerned about those hazards which are a result of our growing dependence upon technology. Out of that concern has come Title III, the Emergency Planning and Community Right to Know Act of 1986, which the President signed into law on October 17, 1986. With those pen strokes we, for the most part, were given another full-time job to compete for essentially the same scarce resources. No federal funding was provided for the implementation of Title III, except for training. To further complicate matters, FEMA's stated policy with respect to implementing Title III is that "the utilization of FEMA funded personnel for other than short term or supervisory roles is not appropriate."

As professional emergency managers representing State and local governments throughout the nation, we fully recognize the need to reduce the national deficit and realize that to achieve this end we, as well as others, must endure the difficult transition period as national priorities are redirected. Our national leaders must also recognize that to not provide sufficient funding to support efforts to plan, train, and maintain the proper infrastructure to deal with emergencies will cause us to pay a significant higher price for response and recovery efforts, not only in dollars, but also in terms of human suffering and lives lost.

It is with this in mind that we address the Administration's proposed "Civil Defense" budget for Fiscal Year 1988. That portion of the FEMA budget identified as "Civil Defense" is the area of primary concern to state and local governments. It is in this category that Federal funding is passed through to the States and their localities.

In an analysis of this budget, it is tempting to relate the agency's request for FY 1988, with its application to the provisions of Gramm-Rudman-Hollings legislation, to the FY 1987 estimate, which also incorporates the deficit reduction efforts of that legislation. If that approach is taken, it would appear that the overall reduction for civil defense is only on the order of 3.2 percent.

The impact is more severe. Let me explain.

From our perspective, there are five specific program categories that are particularly critical to State and local efforts in emergency management. They are State and Local Emergency Management; Radiological Defense, the Population Protection Planning; State and Local Direction, Control and Warning; and Training and Education. (See Attachment 1.)

If one makes a comparison of the funding estimates for FY 1987 against the proposal for FY 1988 in those specific areas, it shows that there is an overall increase for State and local program efforts of about 3 percent. However, in dealing with the impact of this budget on the State and local capacity to deliver effective public safety programs nationally, we must go beyond such a simple temptation, and, instead, relate back to the levels of funding for emergency management efforts in fiscal years 1984 and 1985, when the deficit reduction efforts first began. Only then can one fully appreciate just how significant the adverse impact is, has been, and is proposed to be on states and their local governments in this vital area of public safety categorized as "civil defense."

Attached is a chart which reflects the actual funding by program for FY 1984, FY 1985 and FY 1986, the level of funding enacted in FY 1987, and that originally proposed for FY 1988. (See Attachment 2.) The chart is subdivided into three separate parts; the first deals with those elements which provide direct financial assistance to state and local governments; the second involves those programs that are managed exclusively at the federal level; and finally, FEMA salary and expenses are separately identified. Taken in total, these constitute "Civil Defense" programs funding.

We have endeavored to show both the dollar amounts and the percentile changes between the current budget request and the various levels of funding enacted or experienced prior to deficit reductions, so as to illustrate the magnitude of the decline in resources made available from the Federal government. For example, if we make a comparison between the present request and the actual expenditures in FY 1984, it becomes obvious that the effect on the states and their localities is significantly greater than the conclusions that could be drawn if one simple analyzed the post Gram-Rudman-Hollings fiscal effects. While it may be argued that the change from FY 1987 to FY 1988 is little more than 3.2 percent overall in the civil defense category, by comparing it to the beginning year (FY 1984) when cuts were first applied, note that it is almost a 20 percent reduction overall. In those program elements of primary concern to states and their localities, the magnitude of the overall reduction from the base year of FY 1984 is almost twenty-four (24) percent.

We are concerned that funding for the programs we have specifically identified will continue to be reduced to the benefit of the FEMA in-house programs. While it is not our place to determine the Agency's priorities, nor do we intend to do so, we note that while programs which support State and local efforts are being reduced, FEMA's in-house programs are increasing.

The original FY 1988 civil defense budget request essentially maintains the status quo - almost a "mirror image" of the FY 1987 authorization with certain exceptions.

- Overall "civil defense" funding declines by $4.4 million.

- State and Local Emergency Managmenet increased by $0.4 million, in effect straight-lined, which means an actual reduction because of inflation. It also means that State and Local governments are forced to increase their level of funding to maintain a basic level of service.
- State and Local Direction/Control and Warning increased by $3.1 million. A vast improvement over the past two years when we were struggling with the effects of divestiture on rates for the National Warning System and other operational telephone circuits.
- FEMA salaries and expenses increase again!
- Training and Education decreased by $0.3 million. We understand the decrease is the initial phase of elimination of the stipend program for students attending the Emergency Management Institute. We are adamately opposed to the elimination of this program. It is our contention that without this incentive, there will be a severe reduction in the number of students participating in vital training programs.

We are also concerned about the implementation of National Security Decision Directive 259 and the impact this could have on the original FEMA budget request. The additional $20 million that has been requested for that purpose is shotgunned into almost every line item, having little or no impact anywhere. (See Attachment 3.) We recommend that these additional funds could be utilized better by funding the shortfalls in Radiological Defense ($1.542 million for strengthening the Instrument Maintenance Program and providing for Radiological Defense Officers in all states), and by increasing the level of funding for State and Local Emergency Management by $18.548 million. We would oppose any effort on the part of FEMA to reduce other programs affecting State and local governments to implement the NSDD.

We are still faced with a number of issues which will adversely impact upon the delivery of programs for emergency management. Among these are renewed efforts by FEMA to specifically emphasize war-related priorities and a general trend toward inflexibility regarding the administration of State and local government emergency management programs. Our concerns can be significantly abated if FEMA were to adopt a more meaningful partnership with State and local governments to develop more flexible guidelines for the conduct of all of its programs.

To achieve a more flexible system, one which recognizes the diversity of the several states, the program category "Civil Defense" should be modified to incorporate the principles of the Integrated Emergency Management System. Then, States and their localities, operating under a concept of greater flexibility in regard to the application of the limited resources available, could more reasonably tailor their emergency management programs to accommodate their specific concerns, while still meeting those broad guidelines required to fulfill national policies and goals.

Finally, let me reiterate that the members of the National Emergency Management Association are fully cognizant of and appreciate the need for significant reductions in the federal deficit; but we also know that if Congress fails to provide sufficient resources now to sustain the vital programs for public safety that have been developed, a serious degradation in our capability to protect the people of this country will result. The consequences of that action will be that when disasters come, as they most certainly will, the cost will be significantly greater for our recovery efforts than would have been necessary had we made reasonable expenditures now to insure that every state in the Nation has an appropriate infrastructure to deal with any hazard that might occur, and is able to pursue programs designed to minimize the adverse impact of disasters in the future. We, as members of the emergency management community ask your help in assisting us to achieve these vital public safety roles.

ATTACHMENT 1
CIVIL DEFENSE PROGRAMS
ESSENTIAL TO THE PUBLIC SAFETY

State and Local Emergency Management: The foundation of the comprehensive emergency management effort at State and local levels, EMA is a cost-effective program and provides for a trained cadre of full-time emergency management personnel. The loss of any portion would undermine or impede the ability to respond to emergencies. EMA provides the only organizational funds that flow through states to local governments.

Radiological Defense: The increase use of radiological materials in the private and public sector and the increase in transportation of low/high level waste generates a requirement for trained and immediately available personnel and equipment to respond to hazardous materials accidents.

Population Protection: Provides for all-hazards planning assistance by the States, for local governments, which addresses all emeregncies, man-made and natural. Included are evacuation and sheltering plans and emergency public information.

State and Local Direction, Control and Warning: The heart of all emergency management for state and local government; the loss of this program would destroy the ability to warn, control or to manage emergencies and would increse the vulnerability of our nation's citizens to disasters and emergencies.

Training and Education: The only program which allows for the professional development of emergency managers and for awareness efforts to inform other government officials and the general public. Provides continuity and uniformity of response procedures.

Attachment 2

COMPARATIVE ANALYSIS OF FEDERAL CIVIL DEFENSE FUNDING
1988 BUDGET REQUEST
(DOLLARS IN MILLIONS)

	(1) 1984 Actual	(2) 1985 Actual	(3) 1986 Actual	(4) 1987 Estimate	(5) 1988 Request	Change Col (4)-(5)	Change Col (3)-(5)	Change Col (2)-5	Change Col (1)-(5)
* State & Local Emergency Management	$ 56.8	$ 58.4	$ 55.2	$ 54.8	$ 55.2	$+ 0.4 (+ 0.7%)	$ 0.0 (0.0)	$- 3.2 (- 5.5%)	$- 1.6 (- 2.8%)
* Radiological Defense	10.3	10.1	9.2	9.2	9.2	$ 0.0 (0.0)	$ 0.0 (0.0)	$- 0.9 (- 8.9%)	$- 1.1 (- 10.7%)
* Population Protection	13.0	12.7	11.4	11.4	11.4	$ 0.0 (0.0)	$ 0.0 (0.0)	$- 1.3 (- 10.2%)	$- 1.6 (- 12.3%)
* State and Local Direction Control Warning	12.9	12.0	0.5	0.5	3.6	$+ 3.1 (+ 620.0%)	$+ 3.1 (620.0%)	$- 8.4 (- 70.0%)	$- 14.0 (- 80.5%)
* Training and Education	14.8	13.9	9.5	9.6	9.3	$- 0.3 (- 3.1%)	$- 0.2 (- 2.1%)	$- 4.4 (- 31.7%)	$- 4.5 (- 32.1%)
SUB-TOTAL (1)	$112.6	$107.1	$86.0	$85.7	$88.9	$+ 3.2 (+ 3.7%)	$+ 2.9 (- 3.4%)	$- 18.2 (- 17.0%)	$- 23.7 (- 21.0%)
* Protection of Industrial Capability	4.6	1.5	0.0	0.0	0.0	$ 0.0 (0.0)	$ 0.0 (0.0)	$- 1.5 (-100.00%)	$- 4.6 (-100.0%)
*Research	5.6	4.1	0.02	.1	.1	$ 0.0 (0.0)	$ 0.08 (+ 4.0)	$- 4.0 (- 97.6%)	$- 5.5 (- 98.2%)
* Telecommunications and Warning	15.2	33.4	16.6	26.1	16.9	$ 9.2 (- 35.2%)	$+ .3 (+ 1.8%)	$- 16.5 (- 49.4%)	$+ 1.7 (+ 11.2%)
* Automatic Data Processing	0.0	0.0	0.0	0.0	0.0	$ 0.0 (0.0)	$ 0.0 (0.0)	$ 0.0 (0.0)	$ 0.0 (0.0)
SUB TOTAL	$ 25.4	$ 39.0	$ 16.62	$ 26.2	$ 17.0	$- 9.2 (- 35.1%)	$+ 0.4 (+ 2.3%)	$- 22.0 (- 56.4%)	- 8.4 (- 33.1%)
* FEMA Salaries and Expenses	$ 29.5	$ 27.7	$ 26.1	$ 27.3	$ 28.9	$+ 1.6 (+ 5.9%)	$+ 2.8 (+ 10.7%)	$+ 1.2 (+ 4.3%)	$- 0.6 (- 2.0%)
(work years)	(661)	(564)	(479)	(489)	(489)	(0.0)	(+ 10.)	(- 75.)	(-172.)
SUB TOTAL	29.5	27.7	26.1	27.3	28.9	$+ 1.6 (5.9%)	$+ 2.8 (+ 10.7%)	$+ 1.2 (+ 4.3%)	$- 0.6 (- 2.0%)
TOTAL CIVIL DEFENSE	$167.5	$173.8	$128.72	$139.2	$134.8	$- 4.4 (- 3.2%)	$+ 6.1 (+ 4.7%)	$- 39.0 (- 22.4%)	$- 32.7 (- 19.5%)

(1) Sub Total of programs which provide financial assistance to State and local governments.

COMPARATIVE ANALYSIS OF FEDERAL EMERGENCY MANAGEMENT AGENCY FUNDING
FY84-FY88
(DOLLARS ROUNDED IN MILLIONS)

	(1) 1984 Actual	(2) 1985 Actual	(3) 1986 Actual	(4) 1987 Estimate	(5) 1988 Request	Change Col (4)-(5)	Change Col (3)-(5)	Change Col (2)-(5)	Change Col (1)-(5)
* Civil Defense	$167.5	$173.9	$128.8	$139.4	$134.8	$- 4.6 (- 3.3%)	$+ 6.0 (+ 4.7%)	$- 39.1 (- 22.5%)	$- 32.7 (- 19.5%)
* Comprehensive Emergency Preparedness Planning	6.9	8.7	8.4	9.5	8.7	$- 0.8 (- 8.4%)	$+ 0.3 (+ 3.6%)	$ 0.0 (0.0)	$+ 1.8 (+ 26.1%)
* Radiological Emergency Preparedness	6.2	6.4	6.4	7.4	7.6	$+ 0.2 (+ 2.7%)	$+ 1.2 (+ 18.8%)	$+ 1.2 (+ 18.8%)	$+ 1.4 (+ 22.6%)
* Federal Preparedness	130.8	140.1	143.0	166.8	196.8	$+ 30. (+ 18.0%)	$+ 53.8 (+ 37.6%)	$- 56.7 (+ 40.5%)	$+ 66.0 (+ 50.5%)
* Training and Fire Programs	16.7	24.0	18.6	20.3	15.6	$- 4.7 (- 23.2%)	$- 3.0 (- 16.1%)	$- 8.4 (- 35.0%)	$- 1.1 (- 6.6%)
* Flood Plain Management	61.7	53.0	49.7	51.8	0.0	$- 51.8 (-100.0%)	$- 49.7 (-100.0%)	$- 53.0 (-100.0%)	$- 61.7 -100.0%)
Disaster * Planning Relief Act (salaries & expenses)	6.6	7.0	6.3	9.4	9.9	$+ 0.5 (+ 5.3%)	$+ 3.6 (+ 57.1%)	$+ 2.9 (+ 41.4%)	$+ 3.3 (+ 54.7%)
* Insurance Activities (salaries & expenses)	2.7	2.0	2.3	2.7	0 0.6	$- 2.7 (-100.0%)	$- 2.3 (-100.0%)	$- 2.0 (-100.0%)	$- 2.7 (-100.0%)
* Emergency Food and Shelter (salaries & expenses)	0.0	.1	.1	0.2	0.2	$ 0.0 (0.0%)	$+ 0.1 (+100.0%)	$+ 0.1 (+100.0%)	$+ 0.2 (+100.0%)
* Management and Administration	31.6	35.4	30.7	33.0	34.8	$+ 1.8 (+ 5.5%)	$+ 4.1 (+ 13.4%)	$- 0.6 (- 1.7%)	$+ 3.2 (+ 10.1%)
Total, FEMA operating Programs & Management & Administration	$430.5	$450.6	$394.3	$440.5	$408.5	$- 32.1 (- 7.3%)	$+ 14.1 (+ 3.6%)	$- 42.2 (- 9.4%)	$- 22.1 (- 5.1%)

Attachment 3

HIGHLIGHTS OF FY 1988 BUDGET AMENDMENT FOR CIVIL DEFENSE

The 1988 amended request totals $154,806,000, and begins improvements in the directions specified in the new National Security Decision Directive on Civil Defense (NSDD 259), approved by the President on February 4, 1987. The revised program to implement the NSDD is designed to support the State and local emergency management infrastructure while focusing priority as outlined below, in the $20,000,000 requested by the 1988 Budget Amendment.

(1) State and local crisis management capabilities, to support the population and maintain continuity of government in national security emergencies. Such capability will insure they can continue to operate to provide life-saving information and support for the population and to link with national continuity of government capability to sustain and preserve a viable, democratic society during a national security emergency. The Budget Amendment provides:

- ° $8,108,000 in Telecommunications and Warning to complete procurement of high-frequency radios to link the States, national, and regional locations. Ths will provide radios for 15 States and 7 Regional locations still lacking such equipment.
- ° $1,350,000 in State and Local Direction Control and Warning to develop fallout-protected State emergency operating centers ($1.25M) and to develop cost-effective approaches for improving the Emergency Broadcast System.
- ° $1,100,000 in State and Local Emergency Management to double the number of military reservists assigned to support State and local crisis management activities, and strengthen assessment systems to improve program management.

(2) Population protection capabilities, including information for citizens on practicable actions they can take to improve their chances of avoiding injury or death in emergencies of all types and activities to encourage and support voluntary participation by citizens in emergency preparedness activities. Also included are life support plans to provide food, water, and other essentials to sustain survivors. The Budget Amendment provides the following:

- ° $3,100,000 in Population Protection to initiate programs to: support and encourage volunteerism by citizens, ($1.5M); develop plans and capabilities to support survivors ($1.0M); and reduce shelter survey costs ($0.6M).
- ° $900,000 in Training and Education to develop emergency information materials for the public.

(3) Plans and preparations to improve civil defense capabilities by "surge" actions in time of increased international tension from an in-place base capability and infrastructure developed in peacetime. The Budget Amendment provides for following for surge capabilities:

- ° $4,542,000 in Radiological Defense to begin development of a base for surge production of instruments during a national security emergency and to provide a Radiological Officer for approximately 8 States.
- ° $900,000 in Research to develop plans for rapid improvement of civil defense capabilities in time of escalating international tension.

The 1988 Budget Amendment provides $20,000,000 in addition to $134,806,000 previously requested. The Amendment includes no additional workyears or funding for Federal salaries and expenses.

STATEMENT OF LARRY LARSON, EXECUTIVE DIRECTOR, ASSOCIATION OF STATE FLOODPLAIN MANAGERS

NATIONAL FLOOD INSURANCE PROGRAM

Senator LAUTENBERG. Next is Mr. Larson and Mr. Block. You are confined to the same time restraints. We ask you to summarize your testimony. The fact that you are last doesn't mean that we are least interested, but we are anxious to conclude this session, and we will appreciate your attention to the clock when it kicks off.

Mr. Larson, do you want to go first?

Mr. LARSON. Yes.

I am Larry Larson. I am with the Wisconsin Department of Natural Resources. I work from the state and handle the dam safety and floodplain programs within the state.

I also act as volunteer executive director for the Association of State Floodplain Managers, which is the national organization representing States and locals that actually are responsible for managing flood hazard areas out in the field.

Many of those people, of course, are involved and coordinate with the National Flood Insurance Program, which is the federal program interrelating down to their level.

State and local goals are to reduce flood damages and to reduce total government costs related to floods. To us, that means not only the costs of the Flood Insurance Program but also diaster costs, SBA, FMHA low-cost loans after a disaster, flood control projects, and all the rest of those.

I make that point about total costs, because what I am going to request from our association is your support to prevent another flood insurance premium rate increase on preexisting structures—and by "preexisting" I mean those structures that existed prior to regulations being in effect in a community, or before the National Flood Insurance Program takes effect locally.

FLOOD INSURANCE PREMIUMS

Since 1981, FEMA has doubled the rates on flood insurance premiums. The average cost of a policy, in fact, now exceeds your homeowner policy coverage. The deductible on the policy was raised from $200 to $500, the agent's fee more than doubled, and the excludables were raised—it no longer covers anything in a furnished basement, et cetera.

You might ask: Why do we care? Again, our goal is to reduce total government costs for a flood. We think when the premiums are too high, people don't buy the flood insurance policies or they drop their policies. Remember, it is those people with a preexisting house or structures that want to buy insurance, and when it is offered at an affordable rate—which of course happened through the federal government when private didn't cover it—it is those people which pushed their community to join the program. And it is only when they are in the program that those communities actually regulate new starts to reduce future costs; so, that cycle is very important, and that is why we want those people to maintain their policies.

We think the evidence shows that that is not happening since the rate increases. If you look at the chart in our testimony, flood insurance premiums are about $2 million—they have been flat since 1981 when the premiums started going up.

I want to point out that we don't oppose rate increases on new structures. We think that that is perfectly logical. But the number of policies should be going up at about 400,000 a year, and it has been flat for over 6 years. That is evidenced by the floods they just had in Maine, where massive flooding occurred and only 10 percent of the people who got flooded had policies.

We ask the Congress to put a cap on; no increases until FEMA and the Federal Insurance Administration has done some things to increase revenues and reduce costs, and try and evaluate those programs. It would include things that have been itemized in our testimony such as expand the rate verification, enforce the mandatory purchase requirement, and those sorts of things.

I want to point out that we vigorously support the NFIP, such as the recent mobile home regulations, but that we feel the rate increase must be held down to reduce long-term costs of the entire program.

Senator LAUTENBERG. Thank you very much, Mr. Larson.

PREPARED STATEMENTS

We have received your prepared statement for insertion in the hearing record. In addition, Mr. E. James Monihan, chairman of the National Volunteer Fire Council, has requested that his statement also appear in the hearing record. Without objection, it is so ordered.

[The statements follow:]

STATEMENT OF THE ASSOCIATION OF STATE FLOODPLAIN MANAGERS

The Association of State Floodplain Managers is the only national organization of state and local officials responsible for managing flood-prone areas. We represent those state and local agencies that implement the floodplain management aspects of the National Flood Insurance Program (NFIP). We are also active in flood hazard mitigation and other activities to reduce and prevent flood damages.

Floods cost the nation much more than the dollar figures that appear in the Federal Budget. In addition to the costs to the Federal Emergency Management Agency (FEMA) for disaster assistance and flood insurance claims, federal, state and local government agencies pay for flood fighting and flood control projects. Individual businesses and home owners pay much more in property damages, lost business, and suffering.

In an average year, floods in the United States kill over 150 people and cause over $5 billion in damage to property. This number is increasing as more homes and businesses are built in floodplains.

Our Association wants to stop the increase in flood damages and government expenditures and reduce the disruption and damage caused by flooding. Our members work every day to control new construction in floodplains and advise and assist property owners on how to reduce damages. FEMA's NFIP and hazard mitigation programs also do this. However, only with close cooperation with state and local governments can these programs be effective.

There are two areas in FEMA's appropriations for FY 88 where we have recommendations on how FEMA's programs can be more effective:

1. Congress should not allow another increase in the chargeable flood insurance rates.

2. Continued funding is needed for those programs that reduce flood damages and therefore reduce future federal expenditures.

1. Preventing another rate increase. We are very concerned with the recent direction to make the NFIP self-supporting by 1988. In fact, this issue was rated as the number one national policy concern by our Board of Directors. In its FY 88 appropriations message to the Congress, FEMA included premium rate increases to make the National Flood Insurance Fund (NFIF), the financial mechanism for the NFIP, self-supporting.

First off, we must clarify that there is nothing in the law that says the program has to be self-supporting by FY 88. In fact, the NFIP was created precisely because the private insurance industry concluded that flood insurance could not pay its own way. The NFIP is not an insurance program that should be run as a self-supporting public corporation like the Postal Service. It is a government progam that should be run to meet the goals for which it was created: to assist flood victims and to reduce federal expenditures for flooding.

Secondly, this Association does not oppose actuarial rating of buildings built since a community converted to the Regular Program, the generally accepted date when good floodplain management programs are initiated. Such buildings should pay their own way, even if it means increasing their flood insurance premiums.

However, we oppose increasing the rates and cutting the insurance coverage for older buildings for four reasons:

a. Flood insurance rates have doubled since 1981.

b. The impact of rate increases has been counterproductive.

c. There are other ways to improve program income.

d. There are other ways to reduce program expenses.

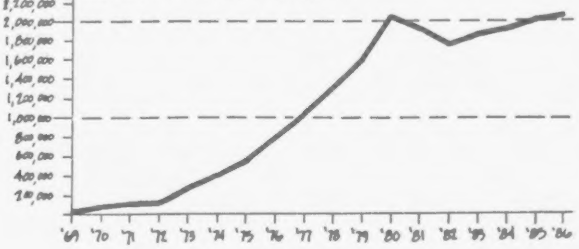
a. Flood insurance rates have doubled. The NFIP was created to provide federally subsidized flood insurance to floodplain residents. In 1981 FEMA started increasing premiums, cutting coverage, and raising the deductibles in order to make the NFIP self-supporting by 1988. Some of the cuts in coverage, such as the denial of coverage for finished basements and contents in basements, have adversely affected many policy holders.

Congress has agreed that large, frequent rate increases should be avoided. In the appropriation and authorization bills last year, a 10% limit on rate increases was recommended for FY 87. In response to Congress' direction, FEMA did not initiate its proposed 27% rate increase. On October 1, 1986, FEMA increased the expense constant (the flat rate charged for the cost of administration) from $32 to $45 for all policies.

Because this $13 increase will not bring in a 10% increase in revenue, FEMA has decided to increase the chargeable rates (i.e. the rates that are "subsidized" for buildings that existed in a community's floodplain before effective floodplain regulations were enacted) from $.45 to $.50 per $100 coverage. As announced in the February 27, 1987, Federal Register, this will take effect on June 1, 1987. When coupled with the increase in the expense constant, those who renew their policies after June 1 are faced with a premium increase of 16%.

As a result of FEMA's efforts to make the program self-supporting by 1988, the chargeable rate will have doubled from $.25 to $.50, the expense constant more than doubled from $20 to $45, and the minimum deductible more than doubled from $200 to $500. In short, America's floodplain residents are paying more than twice what they paid before and they are getting less insurance coverage in return. Their response to this effort is graphically displayed below.

NUMBER OF POLICIES IN FORCE BY FISCAL YEAR, 1969-86
National Flood Insurance Program



b. The impact of rate increases. FEMA estimates that there are 6-8 million buildings in the nation's floodplains. As these buildings receive new mortgages and home improvement loans, federal law requires the owners to purchase flood insurance. There are only two million flood insurance policies in force. If only 10% of the 4 million uninsured buildings are bought or improved each year, the total number of policies should increase by 400,000 annually. This is not happening as can be seen by the chart on the previous page.

Our members have talked to thousands of flood insurance policy holders, both before and after they are flooded. We are getting one consistent message: when policy holders see higher rates and less coverage, they drop their flood insurance policies. In short, people are not voluntarily buying flood insurance and those who have policies are not renewing them.

In return for federally-subsidized flood insurance for their residents, local governments promise to regulate new construction. Floodplain regulations can be very controversial, especially when a local economy needs more business or industry and local officials have to tell prospects that they cannot build what they want to in the floodplain.

As more expensive flood insurance becomes more unpopular, we predict two long term results. First, there will be less incentive for communities to maintain their side of the agreement with the federal government to properly manage floodplain development. As long as rates are reasonable, residents will encourage their local officials to stay in the NFIP. If residents do not want flood insurance, their local officials are more apt to bow to development pressures and allow new construction to aggravate the flooding problem.

Second, as insurance coverage drops, the cost of flooding will be picked up by other federal, state and local agencies. Without the incentive for good floodplain management, flood damages will increase and so will the demand for new federal flood control projects. Without flood insurance, more people will turn to the federal government for disaster assistance.

In 1983, the General Accounting Office reported to Congress that such increases "could be harmful to program objectives by reducing participation and increasing the use of disaster assistance" (GAO/RCED-83-53, page 31). We submit that the issue is not whether the National Flood Insurance Fund becomes self-supporting, but whether the total cost of flooding to the federal government will decrease.

c. Other ways to improve program income. There are numerous ways to increase revenue or reduce expenditures so the NFIP can rely less on the general taxpayer. Raising rates and cutting coverage are only two. We hold that FEMA has not sufficiently tried the other ways. For example, we suggest two feasible and appropriate ways to raise income into the National Flood Insurance Fund.

(1) An expanded Rate Verification Program. Past studies have found that as many as one-half of a community's flood insurance policy application forms had errors in them. Many of the errors resulted in lower premiums. The Independent Rate Verification Program was initiated by FEMA to measure rating errors. So far it has confirmed that there are a substantial number of underpaid policies. Expanding this program is a fair way to bring in more income.

(2) Better enforcement of the insurance purchase requirement. Under the Flood Disaster Protection Act of 1973, federally regulated or insured lending institutions must require flood insurance as a condition of a loan secured by a flood-prone property. As explained above, this requirement should result in large increases in the number of policies in force each year. Our members have found hundreds of cases where lenders are not complying with this law. Many unfortunate ones are discovered after the unprotected properties are flooded. By devoting more staff time to this issue and enlisting the aid of the federal lending agencies (FDIC, FSLIC, etc.), FEMA could increase the policy base and, therefore, program income.

d. Other ways to reduce program expenses. We consider the best way to make the National Flood Insurance Fund self-supporting is to reduce damages to flood-prone property. We have recommended many activities to do this and we volunteered to assist in implementing them. These include: advising all policy holders on how to protect themselves from flooding, providing financial incentives such as insurance rate breaks for owner-initiated floodproofing, providing a rating incentive to communities that initiate damage reduction measures, and devoting special attention to high loss areas.

FEMA has recently started working on some of these approaches. It has published an excellent manual on retrofitting buildings to protect them from flood damage. This Association is helping to distribute copies and promote their use. We are also helping to design and test a community rating system. However, it will take at least a year before the impact of these approaches on flood damages can be measured. Therefore, we recommend that there be no more rate increases or cuts in coverage until these activities are tried and evaluated.

Recommendation: We recommend adding the following language to the FEMA appropriation bill:

> Before increasing the expense constant or the chargeable premium rates, the Director shall submit to the Congress a report on other methods to increase revenue to or decrease expenses from the National Flood Insurance Fund. Such report shall include estimates of the amount of money earned or saved by such methods and whether such methods are appropriate or workable. The report shall be made available for public review and comment 90 days before submission.

2. Flood damage reduction programs. As stated above, FEMA has started some programs to support state or local flood damage reduction or prevention activities. All of these programs have more requests than funds available. Each of them pays its own way by reducing property exposure to hazards or by improving the skills of those responsible for managing emergencies.

We do not support a sudden jump from full funding to 50/50 cost sharing as proposed for some of these programs. Many state and local agencies are just now beginning to accept these programs and staff them. A sudden cut in funds could well force them to drop them altogether. If cost sharing is proposed, it should be phased in over severl years to a 75/25 federal/state arrangement.

Recommendation: The following line items should be funded as noted:

- Comprehensive Emergency Preparedness Planning
  - Hurricane Preparedness: we support funding at last year's level with no sudden jump to 50/50 cost sharing.
  - Dam Safety: we support continued funding at the proposed level.
  - Hazard Mitigation Assistance: we support additional funding for this program which has proven to be very effective and innovative by building on local concerns for flooding to promote comprehensive hazard mitigation.
- National Flood Insurance Fund
  - Flood Studies and Surveys: we support continued funding at the proposed level.
  - Flood Hazard Reduction: we support continued funding at the proposed level.
  - Purchase of Property: we support a change in the funding procedure. Our recommendation is detailed in our position paper on the NFIP reauthorization.
- Disaster Relief Fund:
  - Disaster Preparedness Improvement Grants: we support continued funding at the proposed level.
- Training and Education: we oppose cutting student travel and stipends.

If there are any questions or comments on this testimony, please call French Wetmore, Association Chair, at (312) 793-3864.

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STATEMENT OF THE NATIONAL VOLUNTEER FIRE COUNCIL

Dear Senator Proxmire:

As seems to be an annual event, I solicit the assistance of you and your colleagues on behalf of America's volunteer fire service with reference to the Administration 's annual budget. Specifically, we have grave concern with the FY 88 Budget both as firefighters and citizens as it relates to the federal fire programs. I will address the three areas of our concern in order of their potential impact from our viewpoint.

Stipend Program National Fire Academy

This program has been reduced by $822,000, which represents two-thirds of the total with the stated intent of total elimination within the next two years. This reduction and worse elimination will severely damage the programs of this fine institution, and more importantly from our point of view, will make it impossible for the volunteer firefighters across the country to take advantage of these excellent programs.

The assurance that this is not specifically aimed at the Fire Academy, but that the Administration intends to eliminate all Stipend Programs of government educational institutions is of little consolation to us. I submit to you, Senator, that this institution and it's mission are unlike any other in the federal government system and should be considered as such. We of the volunteer fire service have been given the understanding that we are part of a partnership with us providing protection to the lives and property of our citizens as well as the federal properties and lands located deep in our respective districts, while the government provides assistance of a fine research and training facility and the means to take advantage of its programs. If the Stipend Program is permitted to die, this partnership will dissolve and we will be left with the entire burden.

To further highlight the uniqueness of our situation, I note that in the narrative of FEMA's budget the elimination of this program will "permit state and local governments to share the expense in training their employees". This is interesting, since the major portion of the volunteer fire service bears no direct connection to any state or local government and none of us are any government's employees, so I am not clear on who's going to share this expense. Further compounding this is the fact that Revenue Sharing which has brought some funding through these governmental entities to the volunteer service has now been eliminated. Most jurisdictions have made it clear that this will severely hamper their ability to contribute to our activities.

United States Fire Administration

This budget has been reduced by 3.62 million dollars with the elimination of all Fire Prevention and Arson Control Programs.

Quite candidly, it is difficult to accept that the authors of the budget, even understand the mission of the US Fire Administration. Also, it would be interesting to know what they see as its future mission if these programs are eliminated, since they were mandated in the Fire Prevention and control Act which established the federal government's fire program.

What I do understand the authors to say, is that the programs and products which the Fire Administration has developed and is producing at this time including a drive to not only install smoke detectors but to improve their maintenance, to develop and promote the use of fast acting residential sprinklers and numerous initiatives in arson prevention and control are neither noteworthy nor necessary. I further understand these authors to say that the deaths of 6,000 of our citizens each year, the highest rate in the civilized world, is acceptable and that having achieved this level of death rate, these programs are no longer necessary.

Mr. Proxmire, I submit that these statements are not accurate and further that for this nation, the world's most technologically advanced, to have the world's highest fire incidence and fire death rate is not only unacceptable, but a disgrace which can neither be ignored nor tolerated. These programs have been proven to be effective in reducing both fire incidence and the annual rate of fire deaths and given the opportunity they can continue to attack this problem.

During a hearing last year, I made the comment that I felt that fire prevention education is the key to combating the fire problem, since the vast majority of those who die in fires are lost before the fire department arrives and in fact a great number of them die before the alarm is even received. This statement is still true and I submit to you, sir, that if we are to affect this unacceptable death toll, we must teach the American people to better protect themselves and their property against the ravages of fire. If these cuts are permitted to stand, that education will not take place.

CENTER FOR FIRE RESEARCH

I was delighted to learn that the Center For Fire Research was not eliminated in this year's budget as has been the case numerous times in the past, but my delight was short lived. Looking into the matter further, I learned that last year when Congress interceded on our behalf, an agreement was made that $500,000 would be removed from the Center's budget and in return it would not be attacked in future year budgets.

$500,000 was sacrificed, but one wonders then why in this year's budget the Center for Building Technology has been eliminated as an entity and its responsibilities transferred to the Center For Fire Research with no accompanying funding. Not only will this result in a diminution of funding resources, but also a dilution of personnel effort at the Center For Fire Research, in its primary mission of investigating fire behavior and related matters.

I request the support of you and your colleagues in restoring the Center's budget not only to last year's level, but to the level of FY 86, since the agreement that sacrificed $500,000 has not been carried out and further to remove the additional burden of building technology research from the shoulders of the limited number of personnel available in the Center For Fire Research.

I will greatly appreciate it if you will accept this letter and enter it as my testimony for your Hearings on the FY 88 Budgets of these Agencies.

Mr. Proxmire, on behalf of myself, the National Volunteer Fire Council and America's 1 1/2 million volunteer firefighters, I sincerely thank you and your colleagues for your unwaivering support of the federal fire programs and of our efforts on their behalf. I must note that turning to our elected officials each year to save these programs would be embarrassing at best if it were not for your forebearance, patience and understanding.

Again, I thank you for your support and if I can be of any assistance, please do not hesitate to contact me.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF ALVIN V. BLOCK, PRESIDENT, ESA, INC.

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

Senator LAUTENBERG. Mr. Block?

Mr. BLOCK. I am Alvin Block, president of ESA, a biomedical research and instrument manufacturing company located in Bedford, Mass.

Today I would like to discuss the Small Business Innovation Research Program and its impact on ESA. We have developed a neurochemical analyzer which provides an indication of biochemical activity in the brain and the body by measuring patterns of neurochemicals in a number of body fluids such as blood, urine, and cerebrospinal fluid. These measurements permit the simultaneous qualitative and quantitative analysis of large numbers of these neurochemicals of interest, which is a capability not acheivable by any other method.

Neurochemicals are the message carriers between the brain and the rest of the body, and they report on the state of health of the body and in return carry commands on how it should react.

Various sources have been quoted as saying, "The brain is the last frontier of medical science." There has been an important need identified by many biomedical researchers to improve on methods of detecting, identifying, and measuring the many chemicals in the brain which determine the state of health and behavior. These neurochemical patterns analyzed by the instrument provide correlations to and insights into the mechanism and possible treatment of a number of mental and physical disorders. These include Alzheimer's, Parkinson's, and Huntington's diseases, depression, nausea, and certain carcinomas and types of heart disease. These disorders presently cost society between $100 billion and $200 billion a year. Widespread use of this instrument could have a major, positive impact on the government's health care cost-containment efforts.

SBIR GRANTS

ESA has received three phase I and one phase II SBIR grants. Under these and other research efforts, we have worked with collaborators at Harvard Medical School, the Massachusetts General Hospital, McLean Hospital, the Bedford and Brockton VA Hospitals in Massachusetts, the University of Lowell, and the Wright State University School of Medicine in Ohio.

The research performed with Wright State University was under a NASA subcontract. It was directed at measuring neurochemical pathways in cerebrospinal fluid in animals during motion-induced emesis. A number of differences in the neurochemical patterns were noted in the animals as they went from rest to simulated space motion, back to rest. From this data, it was possible to predict where to intervene with a pharmaceutical to prevent motion sickness. Experiments with an off-the-shelf pharmaceutical were successful in preventing motion sickness.

As NASA moves toward longer space flights and implementing the planned space station, this technology will become more important in predicting and preventing disorders in the astronauts and scientific crews.

Occasionally, plans surface to terminate the SBIR program. We note with pleasure that the Congress has recently extended the authorization for SBIR's to 1993, and I am hopeful that this one story about the successful use of this program will prompt you to more aggressively support the program.

Thank you.

Senator LAUTENBERG. Thank you very much.

Your testimony is so interesting, and we thank you for taking the time and the trouble to prepare it. It will be fully in the record.

[The statement follows:]

STATEMENT OF ALVIN V. BLOCK, PRESIDENT, ESA, INC.

Mr. Chairman and Members of the Committee:

I am Alvin V. Block, President of ESA, a biomedical research and analytical instrument manufacturing company located in Bedford, MA. Today, I would like to discuss the Small Business Innovation Research (SBIR) Progam and its impact on ESA. The SBIR Program has been in existence since 1983. Its stated goals are to:

- stimulate technological innovation;
- use small business to meet federal research and development needs;
- increase private sector commercialization of innovations derived from federal research and development; and
- foster and encourage participation by minority and disadvantaged persons in technological innovation.

I would like to tell you of ESA's success with this program.

ESA has developed a Neurochemical Analyzer which provides an indication of biochemical activity in the brain and the body by measuring patterns of neurochemicals in a number of body fluids such as blood, urine, and cerebrospinal fluid. These measurements permit the simultaneous qualitative and quantitative analysis of large numbers of the neurochemicals of interest, a capability here-to-for unachievable by any other method. Neurochemicals are the message carriers between the brain and the rest of the body, reporting on the state of health of the body and, in return, carrying commands on how it should react. Various sources have been quoted as saying "the brain is the last frontier of medical science". There has been an important need identified by many biomedical researchers to improve on methods of detecting, identifying and measuring the many chemical substances in the brain which determine the state of health and behavior. The neurochemical patterns analyzed by the instrument provide correlations to, and insights into, the mechanism and possible treatment of a number of mental and physical disorders. These include Alzheimer's, Parkinson's and Huntington's diseases, depression, emesis (nausea), and certain carcinomas and types of heart disease. These disorders presently cost society between 100 and 200 billion dollars per year. Widespread use of this instrument could have a major, positive impact on the government's health care cost-containment efforts.

ESA has received three Phase I and one Phase II SBIR grants. Under these and other research efforts, we have worked with collaborators at Harvard Medical School, Massachusetts General Hospital, McLean Hospital, Bedford and Brockton VA Hospitals in Massachusetts, University of Lowell, and Wright State University School of Medicine in Ohio.

The research performed with Wright State University was under NASA subcontract. It was directed at measuring the tyrosine/tryptophan metabolic pathway in cerebrospinal fluid in animals during motion induced emesis. A number of differences in the neurochemical patterns were noted in the animals as they went from rest to simulated space motion back to rest. From this data, it was possible to predict where to intervene with a pharmaceutical to prevent motion sickness. Experiments with an off-the-shelf pharmaceutical were successful in preventing motion sickness.

The pathways which were found to be affected in motion sickness are also known to be affected in a variety of behavioral disorders. While these correlations have not been fully explored, it will certainly be important to crews occupying space quarters for a long period of time.

As NASA moves towards longer space flights and implementing the planned space station, this technology will become more important in predicting and preventing disorders in the astronauts and scientific crews.

As is typical of the spin off that frequently occurs from NASA projects, the model that was developed to study emesis in animals can also be applied to the study of the role of chemotherapeutic agents in causing nausea. We have submitted an SBIR proposal to the National Cancer Institute to investigate this further.

ESA is a small, privately-held company with limited resources. From 1983 to the present time, it has committed over $2M of its own funds to develop this instrument. This has seriously strained our corporate resources. The $650,000 that we have received from SBIR grants has provided additional support to demonstrate the applicability of this technology to a number of medical research problem areas.

Although we developed the instrumentation in-house, it required a medical community input to provide insight into the most appropriate areas for research and to provide biological specimens for analysis. The ability to apply for and receive SBIR grants (which include a peer review) was and is of great value in establishing credibility of the technology, and encouraging medical researchers to collaborate in application studies. We also received a public forum for evaluating the results of our studies. The SBIR Program has fostered much closer ties for ESA with the highest levels of medical technology. Yet, more research is necessary to achieve the goals of better understanding and treatment of disorders which can be addressed with this instrumentation.

A joint proposal with the Mass Alzheimer's Disease Research Center, Mass General Hospital, and Massachusetts Institute of Technology has been submitted to the National Institute of Aging to correlate neurochemical patterns with Alzheimer's disease. The Mass Alzheimer's Center has access to several hundred Alzheimer's, Huntington's, Parkinson's and multiple infarct patients as well as a number of other rare degenerative disorders. Patient histories, familial relationships and clinical data are well documented.

Occasionally, plans surface to terminate the SBIR program. We note, with pleasure, that the Congress has recently extended the authorization for SBIR's to 1993. I am hopeful that this one story about the successful use of this program will prompt you to more aggressively support this program.

SUBCOMMITTEE RECESS

The subcommittee now will stand in recess until Friday, May 15, at 10, in room SD–124, and we will continue to take testimony from congressional and public witnesses on the fiscal year 1988 budgets for the agencies under the jurisdiction of this subcommittee.

The subcommittee is recessed. Thank you very much.

[Whereupon, at 3:45 p.m., Friday, May 8, the subcommittee was recessed to reconvene at 10 a.m. Friday, May 15.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

FRIDAY, MAY 15, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9:55 a.m. in room SD–124, Dirksen Senate Office Building, Hon. William Proxmire (chairman) presiding.

Present: Senators Proxmire, Mikulski, and Grassley; also present: Senator Reid

NONDEPARTMENTAL WITNESSES

HEARING PROCEDURES

Senator PROXMIRE. The subcommittee will come to order. Within the next few hours, we will hear from public witnesses regarding the fiscal year 1988 budget for HUD, FEMA, the Veterans Administration, and other agencies under the subcommittee's jurisdiction.

Before we begin, I want to go over the procedures we will use. Each witness will have only 4 minutes in which to present his or her testimony due to the large number of witnesses. In the 1 minute remaining, a yellow light will come on. The red light will come on when your time is up. Keep in mind that your entire statement will be published in the public hearing records.

Our first witness this morning will be my distinguished colleague, Senator Harry Reid from the state of Nevada.

FEDERAL EMERGENCY MANAGEMENT AGENCY

STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM NEVADA

PREPARED STATEMENT

Senator PROXMIRE. Welcome, Senator Reid. We look forward to your testimony and the testimony of FEMA. We are delighted to have you as our leadoff witness.

Senator REID. I would ask that my full statement be made a part of the record.

Senator PROXMIRE. Without objection, so ordered.

[The statement follows:]

STATEMENT OF SENATOR HARRY REID

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to present testimony about the status of the National Emergency Training Center-West of the Federal Emergency Management Agency in Carson City, Nevada.

This Committee is more than aware of the importance and the need for the Federal Emergency Management Agency (FEMA). FEMA works with the private sector and government at all levels to ensure an effective and prompt response to major emergencies. The numerous committees of Congress which have responsibilities regarding FEMA is testimony to the agency's widespread importance.

Highly trained managers are necessary in order to respond to major emergencies. The National Emergency Training Center-East in Emmitsburg, Maryland has provided such training for years. However, the demand for training at the National Emergency Training Center-East exceeds its capacity to respond. It is estimated that two million public officials in the United States are interested in the specialized programs offered by FEMA through the Emergency Management Institute. NETC-East at Emmitsburg trains approximately 8500 students each year out of approximately 13,500 applicants. It is assumed that many more might be interested if a six month to two year waiting period did not exist.

It was due to this inability to meet training demands that alternatives were considered. After extensive analysis by FEMA, it was determined that an additional site located in the West was the most appropriate alternative. The Stewart Indian School in Carson City, Nevada was determined to be the most appropriate site for a Western training facility. It had the necessary facilities and it was surrounded by federal land which would allow for expansion.

The need for emergency training has been established. The National Emergency Training Center at Emmitsburg cannot handle the current demand, and the cost of expanding the eastern site is prohibitive. The cost of training can be significantly reduced by developing a western facility. In fiscal year 1986, the cost of training per student at the Emmitsburg facility was approximately $400, compared to $96 for the same period at the proposed western site. In addition, it is estimated that airfare expense alone could be reduced by 30 percent. I respectfully request that a 1984 cost analysis paper prepared by FEMA about NETC West be included in the record.

Congress appropriated $3.2 million for fiscal year 1985 to convert and prepare the Stewart Indian School into a training center. In March of 1985, Governor Bryan of Nevada received a letter from the Director of FEMA about the National Emergency Training Center-West. The Director states, "The National Emergency Training Center-West at Carson City, Nevada, continues to be one of the highest priority programs in the Federal Emergency Management Agency. Our target date for opening the school for limited classes is July/August 1985, with additional courses phased as renovations are completed." In May of 1985, FEMA signed a lease agreement with the State of Nevada for $1 per year rental until September 30, 2010.

In January 1986, General Becton notified Senator Laxalt by letter that budget reductions have forced FEMA to reprogram NETC-West monies. In short, the $2.7 million obligated in FY 1985 for renovations would be withdrawn. I must point out that FEMA has subsequently altered this position and has agreed to carry out previous agreements. Congress did not appropriate any funds in Fiscal Year 1987 for the site and FEMA apparently does not intend to request funds for the program in the forseeable future.

The evidence clearly demonstrates that establishing a western emergency training facility is in the national interest.

Mr. Chairman, I want to express my concerns about FEMA's decision to abandon the western training facility. The establishment of NETC-West at Carson City was once a high priority of FEMA. The State of Nevada has acted in good faith in all aspects of its negotiations with FEMA. The State of Nevada's offer to make the site available for $1 a year attests to this fact. It concerns me that promises made can be broken at will. Actions of this nature do not bode well in fostering trust between the states and the federal government.

Again, thank you for your kind consideration as I believe this project is indeed worthy of support.

TRAINING OF MANAGERS

Senator REID. Rather than read the statement to you, Mr. Chairman, I wanted to discuss with you a bit about the Federal Emergency Management Agency's proposed National Emergency Training Center in the area of Carson City, Nev., at the Stewart Indian School.

The Committee, of course, Mr. Chairman, is aware of FEMA and the duties it performs. The one program that FEMA has worked on that has been very important to the country has been training managers to respond to major emergencies throughout the country. The National Emergency Training Center is now located in Emmitsburg, Md. I have been through that facility, and it is really an impressive facility.

The point of my testimony, Mr. Chairman, is to indicate to you that when I served in the Science and Technology Committee in the House, a great deal of time was spent convincing us how the facility at Emmitsburg was simply overloaded. They just couldn't handle any more people; they were turning people away.

I indicated that the facility in Emmitsburg was training approximately 800 to 900 students each year and that 13,000 to 14,000 applied every year. Many, many people were being turned away. Many, many people simply didn't apply.

It was due to this problem that alternatives were considered, and we spent a great deal of time making the Stewart Indian School a place that would be a good deal, in my own vocabulary, for FEMA.

I spent a great deal of my own time, personally, working with the Governor and the people in the state to develop a program so that it would be a good deal for the federal government.

ADVANTAGES OF WESTERN SITE

Originally, as I recall, the state wanted to charge, give or take, $100,000 a year rent. I worked it out so that it would be $1 a year rent, and the people at FEMA were, of course, very happy about this. It is important to have a facility in the West because the Emmitsburg facility is very difficult to get to for people from the West. It is 3,000 miles away, and if there were a place on the west coast, especially near the large state of California, many people could be trained there and it could save the government lots of money. That was one of the large considerations.

In fact, Mr. Chairman, the cost estimated at Emmitsburg was over $400 a year per student, in estimate of cost, whereas in the western site, it would be $96, or less than $100.

The unusual aspect of this is suddenly, we were notified that FEMA was no longer interested in the western facility and that the Emmitsburg facility could handle everything. Well, this simply is not a fact, and as I have laid out in great detail in my statement, Mr. Chairman, not only do we find, in my opinion, a lack of credibility on the part of FEMA; it just isn't good sense or good economics.

We find here a perfect example of where Mr. Miller has obviously tried to save some money with smoke and mirrors. It looks good on the surface, but in the long run it is going to wind up costing the government a great deal more money.

Therefore, I would respectfully request that this subcommittee look closely at those monies that were originally scheduled to go to the facility into the West because it, in effect, would save this country money and give the country better services for training these people in case of emergency.

Senator PROXMIRE. Senator Reid, this is very positive and constructive testimony. As you know, our problem is to try to hold down the overall budget deficit, and it is awfully hard because we would like to fund all programs fully and provide increases. We can't do that.

As I understand it, your testimony is that we can save money if we fund an institution that provides a cost which is less than $100 per student compared to the $400 in the present institution; is that right?

Senator REID. Yes, Mr. Chairman. Perhaps I wasn't direct enough. There was a campaign conducted by FEMA throughout all Congress to show this, in fact, was the case. Suddenly, in my opinion, because of some of these smoke and mirrors that we talk about in the budget, they decided this facility is no longer a cost saver for the government, but no statistics are supplied.

There are a lot of people in Congress, Mr. Chairman, on both sides that talk about saving money. Over the many years you have been here, you have a voting record to go along with it. This is something that is in keeping with my understanding of your voting record. Here is something that actually will be good for the country and, in the not very long term, save a great deal of money for the country.

If this program was such a great program and would save this country money two years ago, it certainly is the same now.

Senator PROXMIRE. Could you give us an estimate and as much documentation as you can of the actual savings that would be achieved over a period, say, of five years?

Senator REID. I would be happy to do that. We have those figures in writing, and I will submit them to the committee.

[The information follows:]

BACKGROUND

PROPOSED
NATIONAL EMERGENCY TRAINING CENTER
WESTERN CAMPUS
NETC-WEST

Prepared by the Office of Congressional Relations
In consultation with the Training and Fire
Programs Directorate

March 14, 1984

FUTURE EMERGENCY MANAGEMENT

TRAINING NEEDS FOR THE

FEDERAL EMERGENCY MANAGEMENT AGENCY

THE FEDERAL EMERGENCY MANAGEMENT AGENCY AND TRAINING

The Federal Emergency Management Agency (FEMA) is the central point of contact in the Federal Government for coordinating a wide range of integrated emergency management activities. We are dedicated to working closely with the emergency management community to achieve a realistic state of preparedness and an increased capacity to respond to emergencies.

FEMA is a supportive partner to the public and private organizations and groups which contribute to emergency management. The many emergencies which threaten life and property are best dealt with at the State and local levels. We support State and local efforts by providing resources and guidance and by being ready to assist when demand exceeds local capabilities.

Highly trained emergency managers are essential to effective emergency management. FEMA promotes the professional development of our Nation's emergency managers through its National Emergency Training Center (NETC). To properly meet this training requirement, a decision has been made to establish an additional emergency management training campus in the western sector of the nation.

The decision to establish the western sector training facility has been made on the basis of the following:

- o The need and acceptance of the NETC program rapidly created a situation whereby the training center is operating at maximum capacity.
- o The need to fulfill FEMA's basic responsibility of our citizens and their property against natural and manmade disasters.

- The increase in the frequency of manmade disasters related to the introduction of complex technologies--hazardous substances--into society.
- Required changes in the program audience increasing the number of individuals that require resident and field training.

THE IMMEDIATE NEED FOR A NETC WESTERN CAMPUS

In May 1983, it was determined that the need and acceptance of training programs at the National Emergency Training Center (NETC), Emmitsburg, Maryland, was rapidly creating a situation whereby the Training Center would be soon operating at maximum capacity. From June 1 through February 17, 1984, we have rejected 2,203 qualified students. The need to fulfill the Federal Emergency Management Agency's basic responsibility of protecting citizens and property against natural and manmade disasters, an increase in the frequency of disasters, the introduction into society of complex technologies--hazardous substances, and required changes in the program target audience that increased the number of individuals requiring training from 1,200,000 to 2,200,000, all places excessive training demands on the existing capacity of the NETC facility at Emmitsburg.

Alternatives of expanding the Emmitsburg facility, greater use of state and local training programs, the use of state universities or an additional western campus were considered. The most cost effective priority to fulfill the need for resident training, and the training versus education applicability of universities would be to establish a western campus.

The addition of an NETC western campus will allow FEMA the means to provide the necessary required training to a much larger portion of the various elements (police, fire, health, public works, etc.) of the emergency management community in the western sector of the country. It will enhance the capabilities of these state and local jurisdictions to manage emergencies due to the proximity of the campus to metropolitan management groups, minimum travel time required, maximum training experience available, and lower air travel costs.

Over 29 potential campus sites were visited and evaluated by senior FEMA staff members. A quantified screen tool was developed and used to assist in the evaluation. Criteria for selection included cost of acquisition, cost of operation, availability of support services, location within 30 percent population centroid, proximity of all-weather air and highway transportation, potential for growth and image of a national training center. Final in-depth analysis of the three top locations led to the conclusion that the Stewart Indian School, Carson City, Nevada, would be the most appropriate site for such a training facility. Other sites proved not affordable, suitable and/or available for immediate occupancy.

Informal discussions with the State of Nevada, pending formal approvals by Congress, indicated 16 buildings having 206,480 square feet of interior space, located on approximately 25 acres of land, could be obtained on an estimated annual lease cost basis of approximately 35 cents per square foot or $72,394. In 1981, the Federal government transferred ownership of 50 acres and certain buildings to the State of Nevada. The use of the school was discontinued at that time and it still remains vacant. Several buildings on the site will be dedicated to the Bureau of Indian Affairs and current plans of the State of Nevada envision a shared occupancy by the community of some not yet defined space. The Federal government continues to own some buildings and approximately 60 acres surrounding the campus site. Nevada officials and residents are actively supporting the FEMA establishment of the western campus of NETC at Carson City.

An estimated 2,200 resident students will attend the campus on an annual basis when in full operation with 70 course offerings available in emergency management and fire prevention and control subject areas. Curriculum will include: Integrated Emergency Management Course, Senior Executive Program, Technological Programs (REP-RADEF), Train-the-Trainer Courses, Fire Prevention and Control Courses, and a workshop program that supports Disaster Assistance Center training, Flood and Earthquake Disaster Assistance, Planning in Hazard Mitigation and Population Protection, and Federal Interagency Hazard Mitigation training. Approximately 1,000 additional fire service students will attend the facility taking short, intensive courses during weekends. The campus will be operated by a modest, full time staff, supported by adjunct professors, consultant experts and IPA's as required.

If Congress provides the necessary appropriations for the western campus, it is anticipated that negotiations with the State of Nevada can be completed, essential rehabilitation/modifications of buildings to meet health and safety codes can be accomplished, and necessary student labs and equipment can be acquired for some resident courses to be started the third quarter of 1985.

On December 22, 1983, Senator Paul Laxalt (R-Nev.) announced that the Federal Emergency Management Agency will locate a western training facility at Stewart Indian School, Carson City, Nevada, and that he will seek funding from the U.S. Senate Appropriations Subcommittee on HUD-Independent Agencies which will fund the project.

OUTLINE OF A COST/BENEFIT EVALUATION FOR NETC-WEST

1. Reduced airfare: For students west of the Mississippi flying to Carson City, compared to students west of the Mississippi flying to Emmitsburg, air fare to Carson City is approximately 30 percent less.

2. Reduced rentals: In Carson City the cost to rent space is 35¢/square foot as opposed to the same space in Washington at a rate of $18-22/square foot

3. Cost of new construction--It is estimated that new construction of 206,000 square feet. would cost approximately $20,000,000. Cost of renovating 206,000 square feet is $10-12 million and annual rent of about $73,000 (206,000 x 35¢). Rental and renovation proves to be cost effective as opposed to new construction for the next 30 years or possibly longer.

4. Adjunct faculty: The average contract is $1,400.00. Part of each contract is air fare which would be reduced for west coast participants.

5. No course development needs associated with NETC West.

6. Printing: If all printing is completed at the NETC main campus, in bulk, it will amount to very little at NETC West.

7. Contracts for services will be cost effective due to lower wage scales.

8. Additional unused existing buildings will provide room for future expansion. If expansion is necessary, it would not necessitate new construction costs, only lesser renovation fees.

9. Reduced dependence on Regional training: Consolidation of 5 administrative and technical support systems into one at an NETC West.

10. When we view the entire system as one, field and resident, the increased dependence on the field program gives us a significantly reduced cost per student.

DESCRIPTION AND EVALUATION OF NEEDS FOR WESTERN CAMPUS

Estimated Range Cost 35¢ to 50¢ per square foot (Lease)

1. Project Size, Cost, Occupants

Recommendation:	New Lease
Occupiable Area:	206,800 square feet
Occupant:	FEMA/NETC and State of Nevada
Current Occupancy:	Vacant
Estimated Annual Lease Cost:	$72,394 (35¢ per square foot)

2. Description of Proposed Project:

- On October 29, 1974, Congress enacted P.L. 93-498 which authorized the appropriation of not more than $9,000,000 for the construction (purchase/ renovation) of facilities for the National Fire Academy for Fire Prevention and Control (NFA). Within the same legislation, the U.S. Fire Administration (USFA) was created and was given the responsibility for oversight of the NFA. Both the USFA and the NFA were placed organizationally in the Department of Commerce.

- In March 1979, the USFA purchased the vacant St. Joseph's College from the Sisters of Charity in Emmitsburg, Maryland. The college was sited on 110 acres with 15 buildings providing the approximate 359,000 square feet of space for operation of a resident college campus.

- In April 1979, the USFA and NFA were transferred to the Federal Emergency Management Agency and subsequently, in order to maximize the use of resources, the USFA and the Civil Defense Staff College (now the Emergency Management Institute (EMI)) were collocated at the Emmitsburg campus. In June 1981, the site was designated the National Emergency Training Center.

PROPOSED SITE OUTLINE
STEWART INDIAN SCHOOL
CARSON CITY, NEVADA

1. Built as an Indian School for the Bureau of Indian Affairs, over an extended period of time, from 1923 through 1973.

2. In 1981, the Federal government transferred ownership of 50 acres and certain buildings to the State of Nevada. The use of the school was discontinued at that time and the site remains vacant.

3. FEMA/NETC plans to occupy 16 buildings, 206,800 square feet of space on approximately 25 acres of the school site.

4. Rehabilitation or new construction of buildings, when cheaper, would be done at Federal government expense.

5. Upgrading roads, parking facilities for students, heating, sewer, water and irrigation systems would be upgraded at Federal expense.

6. Planned Occupancy Use[4]

Building #	Planned Use	Square Feet
6	Dormitory	18,743
12	Dormitory	14,572
13	Dormitory	14,572
107	Dormitory	32,832
15	Kitchen-Dining	11,444
16	Administration[1]	8,416
17	School	41,826
18	Media Shop	3,700
84	Shop	4,581
90	Auditorium	5,857
92	Utilities	3,825
96	Storage	2,710
60	Gymnasium	37,150
11	Quarters	1,182
14	Quarters	1,430
19 & 2[5]	Student Center-Pub	4,000
	Library[2]	00
	Infirmary[3]	00

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[1] Administration Bldg #89--Bureau of Indian Affairs will be used for up to three years (July 1985). Bldg #16 to be renovated to meet short term needs. Upon availability, Bldg #89 will be administration center.

[2] Library to be housed in Bldg #107.

[3] Infirmary to be housed in Bldg #107.

[4] The rehabilitation, new construction, demolition, and interior renovation of the facility is estimated to cost $8,232,805 (does not include $1,730,200 for site improvement).

[5] Bldg #2 demolished, site not used.

7. Buildings vary in construction type: combination woodmasonry, masonry-concrete and wood frame.

8. FEMA would supply furnishings and equipment as required.

Comments

- The Stewart Indian School site, when rehabilitated, will provide an impressive image of a National Emergency Training Academy. It provides the opportunity to be apart from the daily tensions, business, and stress of modern living. It also provides the opportunity for a serene setting for rest, study, dialogue, and special conferences while at the same time being within 45 minutes driving distance from Reno International Airport.

o The following situations must be recognized during any negotiations of a lease for Stewart Indian School:

A. The building rehabilitation/construction program for the 16 buildings is estimated at $8,232,805.*

B. The site improvement costs for roadways, a parking facility and heating, water, irrigation, and sewer systems is estimated at $1,730,200.

C. The extremely low cost of rental of $72,394 per annum over a ten year period represents a strong incentive for the Federal government to enter into a leasing arrangement with the State of Nevada.

o It is proposed that Congress authorize GSA to negotiate and award a lease for 206,800 square feet of space based on the fair annual rental as determined by an appraisal and without an annual rental limitation. The lease may contain an annual escalator clause to provide for increased or decreased costs. In addition, GSA should attempt to negotiate a purchase option and include it in the lease. Approval of this prospectus will constitute authority for up to 10 years of leasing, including the initial terms and renewals of succeding leases as required.

Market Background

o The acquisition of a college campus is a relatively unique situation, with the flexibility that exists for the leasing of commercial/office space being sharply reduced. The search must be nationwide, complicated by the purchase vs. lease option availability, and the space required can be described as special purpose space.

* Current plans by the State of Nevada envision shared occupancy of some not yet defined space. As a result of this planned shared occupancy, the State is undertaking rehabilitation of Buildings 6, 17 and 92 which may reduce FEMA's initial projected capital expenditure.

o Of the three leasing candidate sites:

A. One had a purchase price of $30,000,000 with a leasing cost for the first year being $1,044,000.

B. The second could be leased at a cost of $600,000 per annum--approximately nine times the cost of renting Stewart Indian School space.

C. The rental cost per annum for the Stewart Indian School is approxmiately 35¢ per square foot

o As a further insight; using the Washington, D.C. real estate market as a reference point, current asking rates for fully serviced office space in Washington, D.C. range from $17.00 to $30.00 per square foot. However, a recent survey disclosed that recent leases negotiated by the government in Washington, D.C. have been in the range of $18.00 to $22.00.

Discussion of Alternatives

- Use of government-owned space--no space is available with the specific requirements of FEMA/NETC in the western sector of the country, nor is any expected to be available during the proposed lease term. However, as other Federal agencies review their training facility space requirements, it is possible that space could be available. In the unlikely event that a campus becomes available to meet FEMA/NETC requirements, GSA would review these requirements to determine the feasibility of the training facility expansion without leasing additional space.
- Federal construction--the estimated 1983 cost to construct an amount of space equivalent to the proposed lease is $20,000,000 (not including land cost). There is no Federal construction underway of this occupancy.
- The acquisition of leased space is recommended. This is the only feasible alternative because of the unavailability of government-owned space for meeting FEMA/NETC's need for extra training facility space.
- A present value analysis was not prepared since there is no practical alternative to leasing.
- With the cost of new construction being estimated at $20,000,000 the rehabilitation and construction costs of $10,000,000 plus the 10-year lease costs of $723,940 represents a savings of $9,277,000 to the Federal government.

Statement of Need

It has been determined that:

1. The Federal government's need for space in the western sector cannot be satisfied by existing government-owned property; and
2. To satisfy these space needs, GSA must negotiate the leasing of a campus from the market available.

FACTS ON COST/BENEFIT EVALUATION FOR NETC-WEST

- The need and acceptance of the training programs at NETC rapidly created a situation whereby the Training Center is operating at maximum capacity. At this time, students must wait from 6 months to 2 years for admission to specific courses at the campus. Since June 1, 1983, through February 17, 1984, we have rejected 2,203 qualified students.
- The program target audience increased the number of individuals requiring training from 1,200,000 to 2,200,000 because of an increase in the frequency of disasters and the introduction into society of complex technologies--hazardous substances.

- The addition of the NETC-West campus will allow FEMA the means to provide the necessary required training for the various elements (police, fire, health, public works, etc.) of the emergency management community, thereby enhancing the capacities of state and local jurisdictions to manage emergencies

- The site, Carson City, Nevada, could be acquired on a lease cost-shared basis not yet determined. Nevada officials have indicated 16 buildings having 206,480 square feet. of interior space, located on approximately 25 acres of land, could be obtained on an estimated annual lease-cost basis of approximately 35¢ per square foot or $72,394.

- The school was built as an Indian school for the Bureau of Indian Affairs over an extended period of time from 1923 through 1973.

- In 1981, the Federal government transferred ownership of 50 acres and certain buildings to the State of Nevada. The use of the school was discontinued at that time and it still remains vacant.

- The Federal government continues to own approximately 60 acres and buildings surrounding the campus site. Nevada officials and residents are actively supporting the FEMA establishing of the western campus of NETC at Carson City.

- The current state of repair is fair to excellent. Most buildings require some renovation to meet fire safety codes and upgrading for use as a National Training Center. The building rehabilitation/construction program for the 16 buildings is estimated at $8,232,800. Costs are based on previous engineering studies performed for the State of Nevada and have been adjusted for inflation. Additionally, site improvement costs for roadways, parking facilities, heating, water, irrigation, and sewer systems are estimated at $1,730,00.

- The State of Nevada is currently renovating several buildings which could reduce projected renovation costs, and possibly some arrangement could be made with the State of Nevada and others for a shared occupancy which would reduce the annual operating costs to the Federal government.

- Dormitory, classroom, student labs and library space are the principal problems found at the NETC main campus currently. Additional training funds will be required to satisfy this national need regardless of where this necessary resident training is to be conducted.

- The estimated 1983 cost of Federal construction for the amount of space equivalent to the proposed lease of an already constructed, additional school is $20,000,000 (not including land cost, $95 per square foot). There is no Federal construction underway of this type.

- Over 25 sites were evaluated, visits were made to all of them by senior FEMA staff. A quantified screeening tool was developed to assist in the evaluation and consisted of the following:

    Access to major airports
    Highway quality and capacity
    Driving time to airport
    Public transport availabe

Parking facilities at site
Acquisition costs (lease-purchase)
Availability
Rehabilitation required
Potential for growth
Location relative to population centroid
Availability of police, fire, etc., services
Conformance to building/safety codes
Identity for a national campus
Ramps for disabled
Condition of mechanical systems
Age of facility
On-site lodging--auditorium--cafeteria
Office facilities--storage--classrooms
Past operating cost
Drainage consideration
Space measurement--configuration
Community attitudes
Recreational opportunities
Site improvements needed
Health facilities
Elevators/Air conditioning
Environmental factors
  Air quality
  Waste disposals
  Storm systems

o It is estimated that in the out-years the annual budget for the NETC-West campus will be $3,247,662 in 1984 dollars. This includes facility operations, facility and administrative supplies and equipment and student stipends (does not include salaries and expenses).

o With the cost of new construction being estimated at $20,000,000 the rehabilitation and construction costs of $10,000,000 plus the 10-year lease costs of $723,940 represents a savings of $9,277,000 to the Federal government.

o Use of government-owned space--no space is available with the specific requirements of FEMA/NETC in the western sector of the country, nor is any expected to be availabe during the proposed lease term.

o It was concluded that Stewart Indian School, Carson City, Nevada, would be the most appropriate site for such training facility. Other sites proved not affordable, suitable, and/or available for immediate occupancy.

o The training programs at NETC rapidly create a situation whereby the Training Center at Emmitsburg, Maryland, is operating at maximum capacity. At this time, students must wait from 6 months to 2 years for admission to specific courses at the campus. Recent analysis shows that 2,203 qualified students were rejected between June 1, 1983 through February 17, 1984.

o The total amounts requested for site operations in the FY 1985 budget submission is $2,313,000. Of this amount, $1,085,000 is requested under Civil Defense and $1,228,000 under Training and Fire Programs. This figure includes funding for site operations, space rental, and fire protection renovation. An additional $852,000 is included in the programs of the Emergency Management Institute under Civil Defense and Training and Fire Programs and the National Fire Academy under Training and Fire Programs to fund the cost of student stipends, adjunct faculty, and consultant services for the delivery of resident courses.

- The FY 1985 budget submission for NETC-West includes a resident student projection of 2,200. This is distributed as follows: EMI Civil Defense, 880; EMI Training and Fire, 220; NFA Training and Fire, 1,100. There is no reference in the budget narrative concerning the delivery of short, intensive courses being conducted on weekends for the fire service (estimated 1,000 per year).

- Current planning projections for the acquisition of a part of the Nevada site are based on the use of 16 buildings having 206,480 square feet of interior space, located on approximately 25 acres of land. This configuration will provide a campus with the capacity to train approximately 3,200 students during the first full year of operations. It is planned to lease the desired sections of the site from the State of Nevada. Several buildings on the site will be dedicated to the Bureau of Indian Affairs and current plans of the State of Nevada envision a shared occupancy by a community of some not yet defined space in Building 17.

- An estimated 2,200 resident students will attend the campus on an annual basis with 70 course offerings available in emergency management and fire prevention and control subject areas. Approximately 1,000 additional fire service students will attend the facility taking short intensive courses during weekends.

- The campus will be operated by a modest full time staff, supported by adjunct professors, consultant experts and IPAs as required.

- It is estimated that, in the outyears, the annual budget for the campus will be $3,247,662 (not including salaries and expense money). This figure must be adjusted each year to reflect the impact of inflation.

APPENDICES

NATIONAL EMERGENCY TRAINING CENTER WEST

FY 1985 BUDGET REQUEST

Site Administration

		1985 Request
Activity:	Civil Defense	
	Training and Education NETC West Site Administration (CD-121) o First full year of operation (CD-132) o 880 CD related students first year (CD-132) o Facility Operations Costs (677K) o Facility Maintenance Costs (408K)	$1,085
Activity:	Training and Fire Programs Emergency Management Institute	
	NETC West Site Administration (TFP-7) o First full year of operation (TFP-19) o 220 Emergency Management students first year (TFP-19) o Facility Operations Costs (16K) o Facilities Maintenance Costs (110K)	271
Activity:	National Fire Academy	
	NETC West Site Administration (TFP-21) o First full year of operation (TFP-33) o 1,100 students first year (TFP-33) o Facility Operation Costs (529K) o Facility Maintenance Costs (428K)	957
Site Administration:		$2,313

Non-Site Related Costs

Civil Defense	o.c. 41-Stipends (CD-122)	212
	o.c. 25-Adjunct Faculty (CD-122)	97
National Fire Academy	o.c. 41-Stipends (TFP-23)	312
	o.c. 25-Adjunct Faculty (TFP-23)	231
Total Estimate		$3,165

1st Year Costs

1.	Student Stipends	
	2200 Students @ 237	$524,000
2.	Adjunct Faculty	
	235 @ 1,400	328,000
	Total	$852,000

Stewart Indian School
Carson City, Nevada

Facilities & Administrative Supplies & Equipment

Beds, Mattresses, Furniture, Linens, Blankets	315,000
Draperies	150,000
Kitchen Supplies & Equipment	150,000
Dining Room Furniture	82,500
Classroom Furniture	100,000
Office Furniture	30,000
Carpeting	200,000
Typewriters & Word Processors	30,000
Facsimile Machines (Xerox)	33,000
A/V Equipment	55,000
Office Supplies	32,372
Xerox Paper	50,000
Printing	100,000
Shipping	35,000
	$1,362,372

Stewart Indian School
Carson City, Nevada

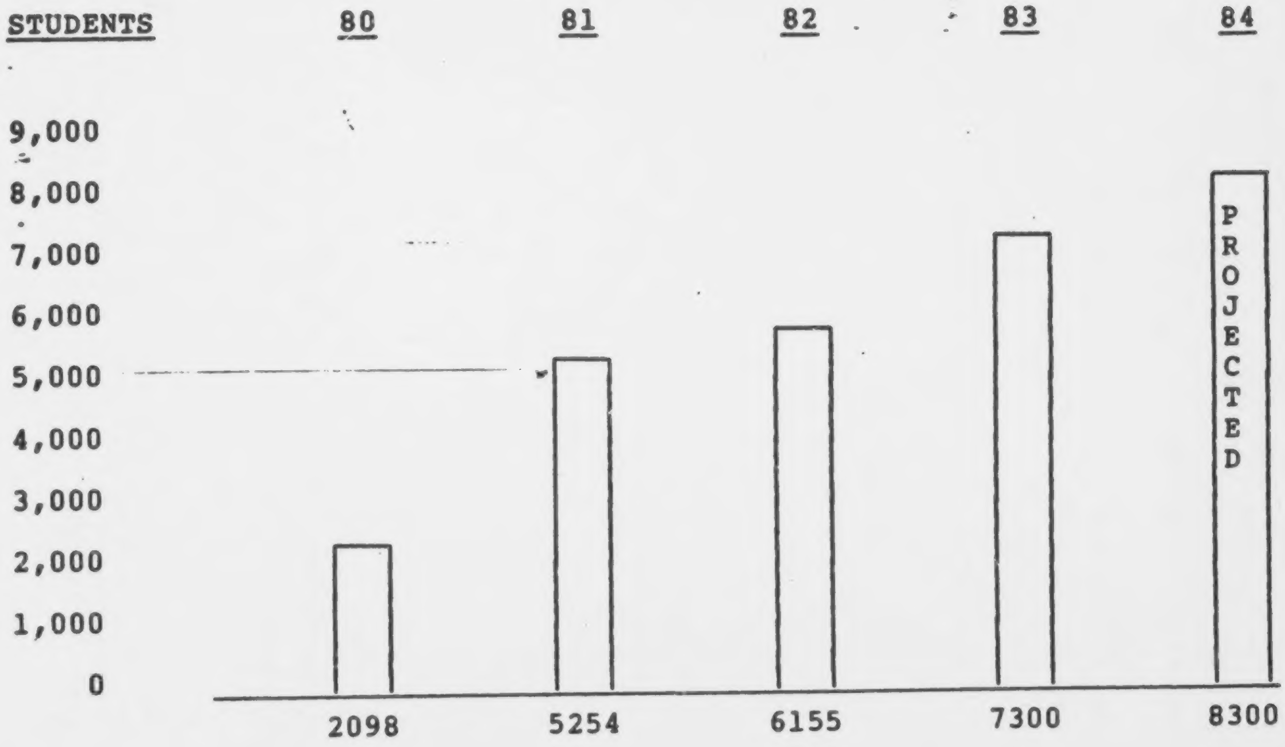
Facility Operations

Lease Costs - 206,840 sq. ft. @ .35	$72,394
Security[1]	0
Linen Services	24,684
Housekeeping	320,000
Building Maintenance	308,550
Grounds Maintenance	0
Equipment Maintenance	15,000
Refuse Removal[1]	0
Medical Services	25,000
Transport System	25,000
Telephone Installation	100,000
Telephone Use	60,000
Electricity[1]	0
Heating[1]	0
Water[1]	0
Sewer[1]	0
	$950,628

[1] It is projected that the State of Nevada will assume these costs under terms of the lease.

RESIDENT STUDENTS

NATIONAL EMERGENCY TRAINING CENTER



PRIORITY AUDIENCES
EMERGENCY MANAGEMENT INSTITUTE

		Field Students	Resident Students
1. Previous Program (FY83)			
Audiences			
A. Federal C.D.	6,000		
B. Federal Other Than C.D.	10,000		
C. State C.D.	72,000		
D. State Other Than C.D.	150,000		
E. Local C.D.	142,000		
F. Local Other Than C.D.[1]	820,000		
Totals	1,200,000	98,000	3,180
2. New IEMS Program			
Audiences			
A. FEMA Headquarters-Regional and Disaster Staff	1,200		
B. Other Federal Agencies	19,000		
C. State Policy	1,000		
D. State Coordinators	12,200		
E. State Operations	212,000		
F. Local Policy[1]	265,000		
G. Local Coordinators[1]	500,000		
H. Local Operations[1]	1,232,400		
Totals	2,242,800	156,940	9,337[2]

[1] Includes private sector: academic community, industry and non-profit relief agencies. Also includes police, fire, health, public works, public and elected officials.

[2] Introduction of new courses, building a cascading train-the-trainer included.

NETC POPULATION STATISTICS
FY 1983

Chart I:

Single Room Dormitory Capacity

Building Location	Number of Rooms
A	89
C	78
D	94
F	70
L	42
Total	373

Chart II:

Weeks Where Population Exceeded Single Room Base Line*

Weeks Over 373	
1/24	375
5/9	377
5/23	417
6/13	396
6/20	466
6/27	377
7/11	415
7/18	484
7/25	473
8/22	386
9/12	426
9/19	392

*Achieved by doubling number of beds in specific rooms

NATIONAL FIRE ACADEMY

1. FY 83 Program

A. Audience		Field Students	Resident Students
Fire Service	1,200,000	13,000	4,300
B. Qualified Rejects			4,000
TOTALS	1,200,000	13,000	8,300

2. FY 85 Program

A. Audience			
Fire Service	1,200.000	13,000	8,300

FY 85 Summary of Requirements

	Field Students	Resident Students
EMI	156,940	9,337
NFA	13,000	8,300
	169,940	17,637[1]

[1] FY83 Experience - 7,300 resident students reached; in FY 85 need to reach 2.4 times more resident students.

EMERGENCY MANAGEMENT PRIORITY AUDIENCES

Local Officials (counties, municipalities, townships, school and special districts)	475,000
State Officials	15,000
State and Local Emergency Managers	12,000
State and Local Emergency Planners	6,000
State and Local Emergency Services Personnel:	
Police (S: 72,000; L: 560,000)	632,000
Welfare (S: 30,000; L: 210,000)	240,000
Public Works (L: 200,000)	200,000
Fire Rescue (L: 400,000)	400,000
Health (S: 20,000; L: 55,000)	75,000
Emergency Communications (S: 2,000; L: 10,000)	12,000
REP Planners	600
Shelter Systems Officers	40,000
Radiation Safety Officers (REP/RADEF)	96,000
State and Local Hazard Mitigation Coordinators	18,000
Federal NDER's	2,200
COG Staffs	18,000
FEMA HQS, Regional and Disaster Rescue Staff	1,000
TOTAL	2,242,800

CHARACTERISTICS OF A RESIDENT PROGRAM

COURSES

(1) Small Audiences

(2) Directed at Highly Technical Skill Areas

(3) Pilot Programs

(4) Innovated Programs

(5) "Shakers and Movers"

(6) Train-the-Trainers (Cascade Effect into Field)

(7) Requiring a Total Immersion Atmosphere

Federal Emergency Management Agency
Washington, D.C. 20472

COST ANALYSIS PAPER: NETC WEST

May 7, 1984

THE PROBLEM

The Federal Emergency Management Agency (FEMA) promotes professional development of the Nation's emergency managers through its National Emergency Training Center (NETC) in Emmitsburg, Maryland. As of May 1983, the NETC facility was approaching maximum physical capacity in the face of growing demand for its services. Consequently, during the period from June 1, 1983 through February 17, 1984, 2203 qualified applicants to the training program had to be turned down.

WHY IS THIS TRAINING IMPORTANT

Prior to the establishment of FEMA and its predecessor agencies, there was no centralized program for coordinating training of state and local emergency management personnel. Curriculum for training varied in quality and detail, as did the quality and numbers of training personnel. Coordination and curriculum design by a central agency such as NETC permitted the establishment of reliable, high quality emergency management training. It also affords the opportunity for exchange of ideas among states and localities. To fulfill this mission, however, it is vital that NETC have the physical capacity to train qualified applicants.

SPACE REQUIREMENTS

Space required to accommodate 2200 students is estimated at approximately 120,000 square feet. Anticipated increased demand for training requires the acquisition of at least 60,000 square feet of additional capacity. Approximately 40 percent of this capacity is assigned to dormitory space, and 40 percent is assigned to classroom, auditorium and other instructional facilities. The balance is assigned to dining space, administrative offices and other support facilities.

ACQUISITION OPTIONS

Five principle options were considered on the acquisition of additional capacity. These options were as follows: 1) Do nothing; 2) Contract with universities and colleges; 3) Develop training programs at FEMA's regional offices; 4) Acquisition of a new facility in the western United States; and, 5) Undertake new construction at Emmitsburg.

Option 1 inadequately supports the basic mission of NETC, which is to prepare emergency managers to deal with the natural and manmade disasters. Benefits to increased preparedness are impossible to quantify. However, given that most major emergency situations involve thousands of lives and millions of dollars worth of property, NETC believes that the increased cost of training emergency personnel is justified.

Option 2, which is to contract with universities and colleges, to some extent removes the aspect of uniform quality of instruction that NETC was established to provide. Due to the critical and sensitive nature of training conducted by NETC, quality control is a crucial issue. Interposing an intermediate group of non-agency actors between NETC and the target clientele is unacceptable. In addition, costs, both personnel and dollars, would be increased considerably because of the expanded burden of managing a variety of contracts in accordance with federal procurement regulations.

Option 3, which is the establishment of training programs at FEMA's regional offices, would also create problems of quality control and cost caused by the introduction of a new level of management. Regional offices do not have the space or personnel for such programs and would have to revert to contracts, which have previously proved unacceptable.

Option 4, acquiring a new western facility, offers major benefits over a comparable capacity expansion at Emmitsburg. As currently structured, NETC offers several programs of instruction. These include resident instruction, outreach programs, and weekend programs. The resident program provides resident training for emergency management personnel from throughout the nation. The outreach program provides essential training at the local level through cooperative agreements with the States and Train-the-Trainer courses provided at the resident facility. The weekend enhancement program provides intensive weekend instruction to emergency personnel within reasonable driving distance of the facility.

A significant benefit of the western facility is its proximity to the localities of decision/policy making emergency management students such as mayors, city managers, fire and police chiefs, public works officials, emergency medical service personnel and others, who are generally precluded from travelling the up to eight hours air and ground time now required to reach the Emmitsburg facility. Another major benefit of a western facility would be to open the important weekend program to emergency personnel in the western states.

Efforts to locate an available existing facility in the western United States led to the nomination of 29 sites. Ultimately, three were selected for final consideration, from which the 206,000 square feet of facility space at the Stewart Indian School campus in Carson City, Nevada, was selected as being preferable for reasons of facilities, location and cost. The campus also provides an academic atmosphere suitable for a national training center. It is estimated that renovating and upgrading this facility and its grounds would cost $10,775,986 in 1985 dollars adjusted from $9,992,805 in 1983 dollars by a 4 percent annual inflation rate. This property would be leased from the State of Nevada for a nominal sum of $72,394 dollars annually. Overall, estimated operating and maintenance costs of $1,620,051 annually are anticipated. This is derived by adding charges for security, grounds maintenance, refuse removal, electricity, heating, water and sewer to the $950,628 previously estimated for maintenance, housekeeping and other service, and then inflating to 1985 dollars. These costs exclude administrative overhead, student stipends, and faculty, which are assumed to be comparable between the two options and thus will not affect the ranking of the present value analysis (See Table 1, footnote **). Discounting these sums at a real discount rate of 7 percent annually over a half year development period, beginning in 1985, and a 20 year operating period, ending in mid-year 2005, yielded a present value of costs equal to $27,590,204.

Option 5, expansion of the Emmitsburg facility by new construction. As available capacity is being utilized, it is estimated that the Emmitsburg facility would require a 179,000 square foot expansion to accommodate an equivalent capacity to that of the Carson City site, given the redundancy of some staff and administrative requirements. The estimated cost to the federal government for construction of this expansion is $18,379,661 in 1985 dollars. Estimated operating and maintenance costs are $1,571,086 annually. Discounting these sums at a real discount rate of 7 percent annually over a 1 year development period, beginning in 1985, and a 20-year operating period, ending after 2005, yielded a present value of costs equal to $31,494,780. Tables 1 and 2 present the research data used to develop these figures. Table 3 is a breakdown of Operations and Maintenance (O&M) costs for NETC West. O&M costs for the Emmitsburg expansion are based on current experience and are documented in Table 4.

CONCLUSIONS

FEMA concludes that the western facility is preferable due to lower overall cost. In addition, it offers certain unquantifiable benefits to students in western states such as the weekend enhancement program and reasonable air travel time, that are currently enjoyed only by their eastern counterparts. FEMA recommends that acquisition of the Stewart Indian School facility commences as rapidly as feasible.

TABLE 1

Facility: Stewart Indian School, Carson City, Nevada

Costs*: Renovation and Upgrade of Buildings and Grounds = $10,775,986

Annual Operating and Maintenance Costs** = $1,620,051

Real Discount Rate*** = 7 percent

Year	FY 85 Real Dollar Costs ($)	Present Value ($)
1985 (construction & 1/2 year operation)	11,586,011	11,200,620
1986	1,620,051	1,463,703
1987	1,620,051	1,367,947
1988	1,620,051	1,278,455
1989	1,620,051	1,194,818
1990	1,620,051	1,116,652
1991	1,620,051	1,043,600
1992	1,620,051	975,327
1993	1,620,051	911,521
1994	1,620,051	851,889
1995	1,620,051	796,158
1996	1,620,051	744,072
1997	1,620,051	695,395
1998	1,620,051	649,902
1999	1,620,051	607,385
2000	1,620,051	567,649
2001	1,620,051	530,513
2002	1,620,051	495,807
2003	1,620,051	463,371
2004	1,620,051	433,057
2005 (1/2 year operation)	810,025	202,363
TOTAL PRESENT VALUE		27,590,204

*All costs are in FY 1985 real (non-inflationary) dollars.

**See operating and maintenance cost breakdowns, Tables 3 and 4. These costs exclude administrative overhead, student stipends, and or faculty, which are assumed to be comparable between the two proposed options and thus will not affect the ranking of the present value analysis.

***Exclusive of the rate of inflation. If inflation were 4 percent, this real rate would be equivalent to a nominal rate of 11 percent. All discounting is performed on a mid-year basis.

TABLE 2

Facility: NETC, Emmitsburg, Maryland

Costs*: Construction Costs = $17,177,253

Operation and Maintenance Costs** = $1,571,086

Real Discount Rate*** = 7 percent

Year	FY 85 Real Dollar Costs ($)	Present Value ($)
1985 (construction)	17,177,253	16,605,877
1986 (begin operations)	1,571,086	1,419,464
1987	1,571,086	1,326,602
1988	1,571,086	1,239,815
1989	1,571,086	1,158,705
1990	1,571,086	1,082,902
1991	1,571,086	1,012,058
1992	1,571,086	945,849
1993	1,571,086	883,971
1994	1,571,086	826,141
1995	1,571,086	772,094
1996	1,571,086	727,583
1997	1,571,086	674,377
1998	1,571,086	630,259
1999	1,571,086	589,027
2000	1,571,086	550,493
2001	1,571,085	514,479
2002	1,571,086	480,821
2003	1,571,086	449,366
2004	1,571,086	419,968
2005	1,571,086	392,494
Subtotal		32,702,345
Salvage value at end of 2005	5,000,000	1,207,565
Total (less salvage value)		31,494,780

*See footnote on Table 1.
**See footnote on Table 1.
***See footnote on Table 1.

TABLE 3

Stewart Indian School
Carson City, Nevada

Facility Operations and Maintenance*

Lease Costs - 206,840 sq. ft. @ .35	$72,394
Security*	275,000
Linen Services	24,684
Housekeeping	320,000
Building Maintenance	308,550
Grounds Maintenance	35,000
Equipment Maintenance	15,000
Refuse Removal	8,000
Medical Services	25,000
Transport System	25,000
Telephone Installation	100,000
Telephone Use	60,000
Electricity	13,200
Heating	200,000
Water*	8,000
Sewer*	8,000
Total (1983 dollars)	1,497,828
Total (1985 dollars)	1,620,051

*Values calculated by State of Nevada and to be negotiated with the State of Nevada. Possible arrangements for cost sharing could be made with other state and federal agencies (i.e., Western Nevada Community College, Nevada State offices, State Training facilities, U.S. Geological Service and others).

TABLE 4

NETC Facility Expansion
Emmitsburg, Maryland

Facility Operations and Maintenance*

Security	$207,679
Linen Services	43,142
Housekeeping	273,776
Building and Equipment Maintenance	549,993
Grounds Maintenance	18,234
Refuse Removal	3,907
Medical Services	19,319
Transport System	27,350
Telephone Installation and Use	65,174
Electricity	73,097
Heating	160,033
Water and Sewer	10,853
Total (1983 dollars)	1,452,557
Total (1985 dollars)	1,571,085

*Based on 1983 costs per square foot

Senator PROXMIRE. Thank you. Thank you very, very much. We very much appreciate your testimony.

Senator PROXMIRE. Senator Grassley, do you have an opening statement you would like to make?

Senator GRASSLEY. No, I don't, Mr. Chairman. I hope that doesn't bother you.

Senator PROXMIRE. No, although we always appreciate your remarks.

Senator GRASSLEY. Thank you very much.

Senator PROXMIRE. From now on, I would like to ask five witnesses to assemble at the head table at once for the sake of expediency. Let me assure you that I am interested in the testimony of every person here, but the number of witnesses here today dictate that we should be as efficient as possible, and I appreciate your cooperation.

We will now take testimony on the Veterans Administration from Mr. Richard W. Johnson, director of legislative affairs of the Non-Commissioned Officers Association; then Mr. Paul Egan—I hope Mr. Egan will come forward, too, deputy legislative director for The American Legion; Mr. Warren Ashe, American Heart Association; Dr. David Hathaway on behalf of the American Federation for Clinical Research; and Dr. Philip Bromberg of the American Lung Association will discuss appropriations for the Environmental Protection Agency.

VETERANS ADMINISTRATION

STATEMENT OF RICHARD W. JOHNSON, JR., DIRECTOR, LEGISLATIVE AFFAIRS, NON-COMMISSIONED OFFICERS ASSOCIATION

Senator PROXMIRE. Fine, gentlemen.

Mr. Johnson, will you go right ahead?

Mr. JOHNSON. Thank you, Mr. Chairman, for the opportunity to appear before the subcommittee in behalf of full appropriations for the Veterans Administration in fiscal year 1988. NCOA appreciates the historical support this subcommittee has given to the VA, and particularly wishes to thank the subcommittee for its support of the supplemental funding bill now before the Senate.

COVERT ATTEMPT TOWARD COST AVOIDANCE

Mr. Chairman, in the recent years, there has been a disturbing trend toward cost avoidance in the Veterans Administration and an obviously covert attempt to transfer responsibility for veterans programs to other areas of government, commercial interests, and even the veterans themselves.

In the recent past, as examples, cuts in VA medical care have transferred responsibility for the care of many veterans to private insurance for which the veterans must pay and to the Medicare system at an estimated cost of $600 million per year. Cost-of-living adjustments, compensation, and survivor benefits have been capped.

User fees have been instituted in the loan guarantee program, transferring the cost of that program to its veteran participants.

Burial benefit eligibility has been reduced, thus forcing survivors to fund that void. As a result, federal spending on behalf of veterans has dropped from 4.4 percent of the budget in 1977 to 2.6 of the federal budget this year.

The Administration is, nevertheless, proposing substantial additional cuts and transfers in veterans programs next year. Among the proposals are transfer of some research responsibilities to HHS and DOD; transfer of GI bill funding to DOD; further reductions in burial benefit eligibility; and additional reductions in medical care of 113,000 outpatient and 13,000 in-patient visits next year, together with associated staff reductions.

LOAN GUARANTEE PROGRAM

Additionally, the Administration has unilaterally and administratively eliminated most beneficiary travel payments for ailing veterans and has now proposed to transfer the whole cost of the loan guarantee program to veterans by increasing participant fees.

If adopted, that fee increase would be more than $1,000 for a benefit administered by the Veterans Administration at an average cost of less than $100 per veteran. This trend, we believe, must be reversed. NCOA is not here asking for the restoration of previously cut benefits, just protection against further erosion, and NCOA is here in support of funding at least at the CBO baseline level as recommended by the Budget Committee.

Essentially, the CBO baseline is a current services budget proposal, but it prevents cuts in hospital care, staffing, and research as proposed by the Administration. It also prevents reductions in burial benefit eligibility and increases in loan guarantee fees. Baseline funding will also allow some minor improvements in VA programs, such as increases in necessary construction for nursing homes and domiciles, and it provides a full cost-of-living adjustment and compensation and survivor benefits.

NCOA asks the subcommittee to provide funding above the resolution-set level for two initiatives of the Veterans Affairs Committee: First is an increase in burial allowances paid on behalf of a veteran who dies from a service-connected cause. This increase would be the first adjustment in this benefit since 1973 and would cost about about $10 million in 1988.

The association also asks continued funding for the Veterans Job Training Act. This most valuable program has continued in the supplemental appropriations bill but will require an additional $60 million in funding next year that is not counted in the Budget Resolution.

Finally, the association urges the subcommittee to prohibit the sale of VA loan portfolio assets as a method of revenue enhancement. Under instructions from OMB, the VA has been liquidating its loan portfolio since the early 1970's. While this practice once provided a temporary source of income, it concurrently eliminated future income which would be supporting the program today.

I see my time has expired, Mr. Chairman. I thank you for the opportunity to appear.

Senator PROXMIRE. Thank you very much, Mr. Johnson. Your statement will be printed in full in the record.

[The statement follows:]

STATEMENT OF RICHARD W. JOHNSON, JR., DIRECTOR OF LEGISLATIVE AFFAIRS, NON COMMISSIONED OFFICERS ASSOCIATION OF THE UNITED STATES OF AMERICA

The Non Commissioned Officers Association of the USA (NCOA) sincerely appreciates the opportunity to appear before the subcommittee in support of full appropriations for Veterans Administration programs and operations in Fiscal Year 1988.

In recent years the Veterans Administration has not fared well in either the budget or appropriations process. Veterans and their survivors have received reduced cost-of-living increases in disability compensation and survivor benefits. Medical care funding has been deficient leading to reductions in both inpatient and outpatient care at VA medical facilities. Activities in job training and loan guaranty programs have at various times been curtailed because of authorization or appropriations deficiencies. Benefit levels in education programs have remained frozen for several years and are not expected to increase this year. Burial benefits have been eliminated for all but indigent and disabled veterans and payment levels have not changed since 1973. Loan guaranty amounts have remained the same since 1980. Agency staffing has declined at the expense of timely services to veterans. And, expenditures for veterans have dropped from 4.4 percent of federal spending to 2.6 percent since 1977.

Despite this record of sacrifice by veterans the Administration this year proposed to increase fees charged to veteran homebuyers, to eliminate burial plot allowances for nondisabled veterans with wartime service, and to rescind $75 million in medical care funding notwithstanding the fact that the VA is turning away 35,000 outpatients per month. In fact, the Administration's proposal would further curtail medical care by an estimated 13,000 inpatient and 113,000 outpatient visits next year. Altogether the Administration proposed a veteran's spending package which was $277 million less in budget authority and $497 million less in outlays than the Congressional Budget Office (CBO) estimated current services (baseline) budget.

NCOA also notes a disturbing trend of cost avoidance that seems to be building in VA appropriations requests. This year the VA wants to transfer the cost of funding the New G.I. Bill to the Defense Department (DoD) and has deleted research requests in favor of DoD and Department of Health and Human Services funding for these programs.

In the current budget request the VA seeks to transfer the cost of the loan guaranty program to its veteran participants and concurrently wants to allow the investment community to gratuitously profit from loan sales and elimination of fixed maximum interest rates. In past years, the VA has sought, successfully, to divest itself of responsibility for health care of a large segment of the veteran community by transferring that cost to veterans, who will now pay higher insurance premiums, and the Medicare System. And, the VA has ignored the need to keep other major programs current to the needs of veterans and their survivors as is the case in education and rehabilitation programs.

Essentially, the VA seems to be divorcing itself, little by little, from the constituency it is designed to support. NCOA can only wonder if this is not building to a point when someday all servicemembers will be contributing from their monthly pay to support veterans benefits or if there will be any veterans benefits for those who serve their nation. This trend must stop before it becomes impossible to rebuild the agency to the level of support necessary for veterans' programs. Anti-war activists of the sixties used to ask, "What would happen if we had a war and nobody came?" As services to veterans continue to erode, they may have their answer.

Both the Veterans' Affairs and Budget Committees have done excellent work to halt the trend, at least for FY 1988. Almost all of the benefit reductions proposed by the Administration have been rejected. Additionally, the Veterans' Affairs Committee has proposed and the Budget Committee has concurred with a full cost of living adjustment (COLA) in disability compensation and survivor benefits. In fact, this is the only "Direct to the Veteran" benefit improvement proposed in the budget.

The budget resolution also allows for increases in VA construction funding for nursing homes, a very necessary step toward providing adequate care for an aging WW II veteran population, and accelerates funding for the conversion of acute care beds to nursing use. Moreover, the budget approves the restoration of severely needed staffing in the areas of medical care and veterans' benefit services. Beyond these few improvements, however, the VA budget as proposed in the Senate Budget Resolution is essentially a current services budget, adjusted for inflation and containing a full cost-of-living increase in benefits for veterans disabled by service and for the survivors of veterans who died as a result of their service.

Unfortunately, the Budget Resolution does not include funding for continued placements under the Veterans' Job Training Act, a very successful program designed to provide job training to long term, unemployed veterans. Hopefully, the committee will fully fund the program in FY 1988. Additionally, the Veterans' Affairs Committee requested budget authority of a mere $10 million to increase burial benefit payments for veterans who die of service connected causes. As noted earlier, these benefits have severely diminished in value since payment levels were set in 1973. Together, these improvements in veterans programs exceed the CBO baseline by $70 million.

NCOA therefore urges the committee to sustain the actions of the Senate Veterans' Affairs Committee and fully fund the VA at the committee requested level.

Finally, NCOA urges the committee to prohibit the sale of VA assets when proposed only to create revenue, including the sale of loan assets. At one time the VA Loan Guaranty Revolving Fund (LGRF) held portfolio assets producing sufficient revenue to support the entire VA loan program. In fact, appropriations were not required to support the fund between 1958 and 1979. However, because the VA, at the direction of OMB, began selling the VA portfolio in the 1970's to produce short term revenue, the program is no longer self-supporting. Indeed, while appropriations of $200 million may have been required to keep the program solvent through the economic recession of the early 1980's, portfolio liquidations and the associated loss in revenues made appropriations of over $2.5 billion necessary to sustain the program. Further sales of program assets will only make the need for future appropriations greater and are thus opposed by NCOA.

Thank you.

STATEMENT OF PAUL EGAN, DEPUTY LEGISLATIVE DIRECTOR, THE AMERICAN LEGION

VETERANS JOB TRAINING ACT

Senator **Proxmire**. Mr. Egan?

Senator **Egan**. Thank you very much, Mr. Chairman. To my right is John Sommer, the deputy director of the National Debt and Rehabilitation Commission. He will summarize our statement, but I would like to make just a few remarks, first of all, to thank you and the members of the subcommittee for approving additional funding for the Veterans Job Training Act in the current fiscal year and to urge you to add some funding for that program in fiscal year 1988, and we think that that program is certainly warranted.

As a matter of fact, approximately 17 percent of the workforce consists of veterans, yet 26 percent of all displaced workers are veterans. We think that that program can be very useful in addressing those problems. So consequently, we attach a good deal of importance to that program.

Senator **Proxmire**. Thank you, sir.

Mr. **Sommer**. Mr. Chairman, in my summary, I will just touch on three or four issues of importance to the American Legion.

EMPLOYMENT REDUCTION

With respect to the Department of Veterans Benefits, the proposed budget calls for a decrease in average employment of 296 FTEE. This includes losses of 255 in compensation, in pension and education; 95 in veterans services; and 16 in vocational rehabilitation and counseling. If these employment reductions are enacted, the average employment in DVB will have been reduced by well over 5,000 since fiscal year 1979.

These constant personnel losses are causing innumerable problems within the regional offices of the Veterans Administration and are adversely impacting on the quality and the timeliness of the delivery of benefits and services to veterans. The American Legion recommends that at least the 296 DVB personnel be restored in fiscal year 1988.

DEPARTMENT OF MEDICINE AND SURGERY

In the Department of Medicine and Surgery, the Administration has estimated that in fiscal year 1988, an additional $92.2 million and 2,350 FTEE can be saved and 18.6 thousand fewer veterans would be treated by eliminating funds that would otherwise be used for the treatment of category C veterans under the means test. To the American Legion, this is totally unacceptable. We truly believe that all veterans using the VA system would suffer if these reductions were made.

The proposed budget contains a total net personnel loss in DMNS of 3,800 and 13 FTEE. We are adamantly opposed to any further reductions of health care professionals in the VA medical care system.

During the past several years, OMB has used a variety of schemes in its attempt to shrink the Department of Medicine and Surgery. As a result, the VA is now suffering severe shortages in nurses, pharmacists, and physical and occupational therapists.

Further reductions in staffing will result in irreparable damage to the VA medical care system, and, we feel, an erosion of the quality of medical care that is being provided to the nation's veterans.

With respect to medical construction, the Veterans Affairs Committee has recommended the provision of additional funding for up to four unspecified additional nursing home construction projects in the VA's priority listing. This would amount to about $20 million in authority and $1 million in outlays as compared to the administration's budget.

The American Legion strongly supports this recommendation. It concerns us that there are no nursing home care units included in the proposed budget for fiscal year 1988. During the fiscal year 1987 budget process, we expressed our extreme concern about the administration's plan for the future with respect to nursing care that dictated no new independent nursing home care unit construction and greater reliance on state veterans home and community nursing homes.

I see I have the light, Mr. Chairman. We thank you for the opportunity to present this summary.

Senator PROXMIRE. Thank you, Mr. Sommer, very much. Thank both you gentlemen.

[The joint statement of Paul S. Egan and John F. Sommer follows:]

STATEMENT OF PAUL S. EGAN, DEPUTY DIRECTOR, LEGISLATIVE COMMISSION, THE AMERICAN LEGION

Mr. Chairman and Members of the Subcommittee:

The American Legion is pleased to have this opportunity to present its views on appropriations for Function 700 (Veterans Benefits and Services) for Fiscal Year 1988.

In the budget that it submitted to Congress, the Administration has proposed for the Veterans Administration, budget authority of $27.575 billion, up approximately $475 million from FY 1987, and outlays of $27.045 billion, up nearly $135 million.

While the proposed increase in funding would appear to be a positive move on the part of the Administration, there are a number of ill-concidered proposals woven through the fabric of this budget. However, the Committee on Veterans Affairs, in its report to the Committee on the Budget, has set forth a series of recommendations, many of which address what we perceive to be shortcomings in the Administration's budget, and we are supportive of these recommendations on funding levels for specific VA programs and activities.

Additionally, we feel it imperative to emphasize the fact that the portion of the total Federal budget consumed by veterans programs continues to decline, as it has consistently for the past twelve years. In Fiscal Year 1975 the VA budget represented a full 5 percent of the total Federal expenditures, where in the current fiscal year it represents about 2.5 percent.

DEPARTMENT OF VETERANS BENEFITS

Direct benefit programs administered by VA through the Department of Veterans Benefits will consume 57 percent of the total VA budget in FY 1988. These programs are, for the most part, entitlements that statutorily must be funded, and they are benefits that are meeting the real needs of the veteran population they are intended to serve.

These benefits are administered through 59 regional offices. The proposed budget calls for a decrease in average employment in DVB of 296 FTEE. This includes losses of 255 in Compensation, Pension and Education; 95 in Veterans Services, and 16 in Vocational Rehabilitation and Counseling. Token FTEE gains of 30 in Insurance, 24 in ADP Systems Management, 12 in Loan Guaranty and 4 in Executive Direction are also proposed.

Mr. Chairman, if these employment reductions are enacted, the average employment in DVB will have been reduced by well over 5,500 FTEE since FY 1979. This figure does not include the transfer of the Office of Data Management and Telecommunications into DVB, because ODM&T personnel are not involved in the hands-on delivery of benefits and services. These constant personnel losses are causing innumerable problems in the regional offices, and are adversely impacting on the quality and timeliness of the delivery of benefits and services to veterans.

The American Legion recommends that at least the 296 DVB personnel be restored. This would require an additional $10 million, for a total of $827 million in General Operating Expenses.

With respect to specific benefits, we adamantly oppose the Administration's proposals to change the eligibility for the plot allowance; increase the VA home loan origination fee; establish a lender/borrower negotiated interest rate with respect to VA home loans; and index disability compensation and dependency and indemnity compensation to Social Security for the purpose of COLAs.

DEPARTMENT OF MEDICINE AND SURGERY

There is no question that the most vulnerable area of the VA budget is the medical care program. The viability of this important program depends entirely upon the appropriation of funds by Congress. Unfortunately, medical care is also becoming a target of the Administration's attempts to effect further cost savings.

The proposal for all medical programs for FY 1988 is slightly over $10.2 billion, representing 38 percent of the total VA budget. This is an overall increase of approximately $339 million over the current fiscal year funding. Direct medical care consumes the largest part of this funding at just over $9.9 billion. While on the surface this increase would appear to be adequate, closer examination reveals a number of shortfalls in the medical care account.

To begin with, the Administration's figures are somewhat skewed, in that it has boasted a $414 million increase in medical care over the FY 1987 level - however, that is after the proposed rescission of $75 million from the FY 1987 medical care budget. The funds that are to be eliminated are those that would otherwise be used during the last five months of FY 1987 for the treatment of category C veterans.

With respect to FY 1988, OMB estimates that an additional $92.2 million and 2,350 FTEE can be saved, and 18.6 thousand fewer veterans would be treated under this proposal. To The American Legion this is totally unacceptable. The Administration has stated that "the VA will continue to furnish care to nonservice-disabled veterans with incomes above $25,000 in locations where resources remain available". We truly believe that all veterans using the VA system would suffer under this plan.

Even more basic than this, however, is the fact that the Congress did not intend for category C veterans to be eliminated from the VA medical care system. PL 99-272 states that the Veterans Administration may furnish needed hospital and nursing home care to veterans in category C, who agree to pay a copayment, to the extent that resources and facilities are otherwise available. Nowhere in the legislative history of this law do we find even the faintest hint that the Congress felt that medical care funding should be reduced by an amount based upon the estimated number of category C veterans who may seek treatment from the VA. This is another case of OMB attempting to impose its will upon Congress.

The Administration's budget also includes a net personnel loss of 3,813 FTEE. Upon close examination of the figures for average employment, the situation looks even more dismal. Reductions of 4,267 FTEE in VA hospitals, 405 in outpatient services, 57 in miscellaneous benefits and services, and 4 from VA domiciliaries are proposed, as are increases of 913 in nursing home care units, and 7 in non-VA programs support. Of the 3,813 FTEE, 1,400 are to be eliminated during the last 5 months of FY 1987, along with the rescission of $75 million.

Mr. Chairman, The American Legion is totally opposed to any further reductions of health care professionals in the VA medical care system. During the past several years, OMB has used a variety of schemes in its attempt to shrink the Department of Medicine and Surgery. These have included personnel reductions based on inadequate funding, the implementation of programs such as the reduction of GS 11 through 15 positions, and by proposing to treat fewer "low priority" veterans. In reviewing the language of the FY 1988 summary of program resource changes, we see, aside from the projected loss of 2,350 FTEE based on the treatment of fewer category C veterans, other explanations given for personnel reductions such as a "savings" of 1,991 FTEE to be achieved through a projected one percent productivity increase. The VA is now suffering severe shortages in nurses, pharmacists, physical and occupational therapists. In the opinion of The American Legion, further reductions in staffing will result in irreparable damage to the VA medical care system, and the erosion of the quality of medical care that is being provided this nation's veterans.

There is not an increase in the per diem rates relating to the State veteran home program included in the budget proposal. The last increases in per diem rates were set forth in PL 98-160, effective April 1, 1984. We are aware that 38, U.S.C. 641(c) currently requires the Administrator to submit a report every three years to the Committees on Veterans Affairs on the adequacy of the per diem rates payable to each State for domiciliary, nursing home and hospital care for each veteran receiving such care in a State home. The first report was to have been submitted not later than June 30, 1986. The American Legion believes that the fair sharing of the cost of providing extended care for elderly and disabled veterans will encourage States to meet the needs of the aging veteran population. We urge that the per diem rates be increased, keeping in mind that they have been static for three years. The Committee on Veterans Affairs estimates that the increase would amount to $13 million.

The beneficiary travel program reflects a "resource realignment" based on a "reform" of the program that began in FY 1987, equating to a reduction of $18 million from the program, leaving a proposed funding level of $50 million for FY 1988. The American Legion is opposed to the recent changes to the regulations relating to the beneficiary travel program which limit payment to veterans residing over 100 miles from the nearest VA medical center. Justification for the proposed changes in regulations is apparently based on the increasing cost of the program account, which was in excess of $100 million for the immediate past fiscal year. Concern at the escalating cost is understandable. In our opinion the increased cost can be ascribed to two principal factors: The increasing number of aging veterans who need medical care, and possible weaknesses in the administration of the benefit at the station level. As to the first cause, it is a demographic development that has been anticipated for a number of years, and nothing can be done about it. Older veterans are developing the need for more health care. Evidence of this fact is seen in the escalation of the number of outpatient visits provided by VA each year - now in excess of 18 million and rising. It is also true that poorer veterans become ill earlier and more seriously ill than veterans higher on the economic ladder. These are demographic factors that have been plotted for years. Poor veterans who are ill are either going to get needed care from VA, or from other publicly supported medical programs, or they are going to do without. The Federal Government, through VA has a direct obligation to help these veteran as much as possible, and to do that the beneficiary travel allowance is an essential factor.

With reference to the second factor mentioned above, weaknesses in the administration of the beneficiary travel allowance, The American Legion is aware that one of the problems with this benefit has been the potential for abuse and/or sloppy administration of the benefit. It is our judgment that this problem can be minimized with careful administrative procedures. We feel that with careful management, substantial cost containment can be effected. It is also true, however, that continuing increase in the cost of the benefit must be expected as the large pool of surviving World War II veterans continues to grow older, and as the cost of travel, along with all other costs, continues to show some increase. This is a justifiable and reasonable increase in the cost of veterans benefits that should be accepted and provided by the Federal Government.

Medical and Prosthetic Research

The Administration has proposed an increase of slightly less than $2.3 million in research funds for FY 1988, up to $198.8 million.

This appropriation provides funding for program activities in medical research, rehabilitation research, and health services research. As this Subcommittee knows, much of the research in which VA engages is basic research that is advantageous not only to veterans, but is of direct benefit to all mankind.

The Senate Veterans Affairs Committee has recommended that $10 million in budget authority be added for currently targeted high priority VA medical research in the following areas: Research related to aging, alcoholism, schizophrenia, spinal cord injury and tissue regeneration, delayed stress disorders, and the health of former prisoners of war; and for AIDS research. This includes the addition of 241 FTEE. The Committee also recommends the addition of $3 million in funding for prosthetics and other rehabilitation research projects, including 53 FTEE. The American Legion supports these recommendations. The Federal Government could make no wiser an investment than ensuring a vigorous and viable VA research program that benefits not only veterans, but all Americans.

Grants to the Republic of the Philippines

The budget message provides a grant of $500 thousand to the Veterans Memorial Hospital in Manila to replace and upgrade equipment and to rehabilitate the plant and facilities. This grant has been made by the United States consistently since the end of World War II. The Veterans Memorial Hospital cares for many Filipino veterans who served in the Allied cause during WWII. There is certainly an obligation by this country to continue to show our gratitude and concern for them. The American Legion continues its support for this grant.

GRANTS FOR CONSTRUCTION OF STATE EXTENDED CARE FACILITIES

A decrease of $400 thousand, down to $42 million is proposed for grants for construction of State extended care facilities.

We are extremely aware of the importance of the services provided by State homes, in that they have substantially reduced the burden that otherwise would have been borne by the Veterans Administration. There are now State veteran facilities in 35 States with 45 nursing homes, 43 domiciliaries and 7 hospitals. The Administration's request would provide for five projects which would produce an additional 371 nursing home and 450 domiciliary beds as well as 12 non-bed producing renovation projects in seven States.

In examining the program, we note that there is currently a backlog of 63 projects representing requests for over $126 million. What this means is that if a State submits a request for a grant for funding of a project today, it may receive funds four to five years in the future.

The American Legion considers this program a wise investment, and when considering the ongoing efforts to reduce Federal spending, the role of the State homes is even more significant. Therefore, we do not believe it wise to reduce the amount of funding to this program. As a matter of fact, The American Legion recommends that $52 million be provided as matching grant money for the construction of State veterans homes, an increase of $10 million over the Administration's proposal.

CONSTRUCTION PROGRAMS

The Administration's budget proposal recommends a nominal increase in The VA's construction programs of close to $37 million, up to $525.7 million. The American Legion feels that the proposed increase reflects a recognition of the need for renovation and replacement projects within the system. However, we have specific concerns which shall be addressed in a moment.

An important point, which The American Legion has espoused for several years, must be reiterated at this juncture. There is a distinct need for adequate funding for medical construction in the Veterans Administration because the capital plant of the medical care system is deteriorating. The reasons for this are several; one of them being serious underfunding of this program for several years until recently. This means VA is playing catch-up with its capital plant renovation and replacement program. The facilities have aged more while little was being done, and costs have escalated. It has been a losing proposition all around. Finally, the Government has been trying to make up for lost time, and it is costing alot of money, but it is still a good investment. As we have said many times, the capital plant of the VA system is a multi-billion dollar investment by the Federal Government, and it must not be allowed to deteriorate.

It was distressing to see that only two replacement hospitals were included in the Administration's FY 1988 projection. As we have stated in the past, the Office of Management and Budget is only fooling itself by delaying the funding for badly needed projects. Such a practice is false economy and will end up costing more in the long run, rather than saving the Government money, because the longer the projects are delayed the more it will cost to build them.

The Veterans Affairs Committee has recommended the provision of additional funding for up to 4 unspecified nursing home construction projects in the VA's priority listing. This would amount to $20 million in authority and $1 million in outlays as compared to the Administration budget. The American Legion strongly supports this recommendation. It concerns us that there are no nursing home care units included in the Administration's projection for FY 1988. The only funds requested for nursing care are $4.5 million under minor construction for the conversion of hospital beds to nursing care beds and for renovation of NHC wards to meet VA criteria standards. During the FY 1987 budget process, The American Legion expressed its extreme concern about the Administration's "plan for the future" that dictated no new independent nursing home care unit construction, and greater reliance on State veteran homes and community nursing homes. While we have no quarrel with using community nursing homes where appropriate, and we certainly support the State veteran home program, we must again express our concern over this issue.

In concluding our remarks on medical construction it must be stated that in the opinion of The American Legion, allowing the capital plant of the VA medical care system to deteriorate makes no sense at all and, in fact, contradicts the Administration's position on national defense when one considers that the VA medical centers constitute the principal contingency resource to treat returning casualties during a war or national emergency.

Mr. Chairman, we thank the Subcommittee for its consideration of the views of The American Legion.

STATEMENT OF WARREN K. ASHE, PH.D., AMERICAN HEART ASSOCIATION

MEDICAL RESEARCH SERVICES PROGRAM

Senator PROXMIRE. Our next witness is Dr. Warren Ashe, of the American Heart Association.

Dr. Ashe?

Dr. ASHE. Mr. Chairman and members of the subcommittee, I am the assistant dean of research at the Howard University College of Medicine; member of the board of directors of the National Heart Association; and the chairman of the local affiliate of the Heart Association.

I am very pleased to have this opportunity to appear before your subcommittee to take the association's stance on 1988 funding recommendations for the Veterans Administration's medical research services program.

Heart disease, stroke, and related disorders account for almost as many deaths as all other causes of deaths combined. In 1987 alone, the cost associated with cardiovascular diseases is estimated to be $85.2 billion for physician and nursing care, hospital and nursing home services, medications, and lost productivity due to disability.

Our ability to combat cardiovascular disease directly correlates to the level and quality of overall support of basic and clinical research and information efforts.

Even though the Veterans Administration medical research services program's supporting for cardiovascular research makes up only a small portion of overall federal research contribution in this area, we believe that we deserve the strong support of the AHA and the Congress, as well.

Not only is the research supported by the VA an integral part of overall biomedical medical research in this country, but the investigators that it supports also provide significant core faculty support at major medical schools affiliated with VA institutions. The MRS provides funds to VA-based faculty members at various stages in their careers; for multicenter cooperative studies; and funds for research equipment and construction.

Furthermore, the presence of a VA research program aids universities in their recruitment efforts.

This small but highly competitive research program supports the approximate 2,800 investigators at 165 VA centers located throughout the country. Among these VA researchers are many distinguished scientists and several Nobel Laureates.

For example, in the past year, numerous VA investigators have received awards for recognition of their efforts in research. In the area of cardiovascular research, Dr. William H. Oldendorf of the San Diego Medical Center was awarded the AHA's Harry Goldblatt Award for his achievements in the field of hypertension research. In addition, Dr. Stephen Kovacks, research physicist at the Tampa Medical Center, was honored by the Society for Engineering for his development of a left ventricular assist device.

CARDIOVASCULAR SURGERY ACTIVITIES

Examples of on-going cardiovascular surgery efforts funded by the VA include the following: A cooperative study evaluating medical versus surgical treatment of stable angina in 636 patients; studies into the efficacy of various medical regimes for the treatment of hypertension; studies of the myocardial adrenergic function; and studies into the effects of active and passive smoking on endothelium and platelets.

The VA's ability to fund these and other important research projects is being undermined by the level of funds allocated to the MRS program. The administration has proposed a fiscal year 1988 funding level for the VA MRS program of $172,598,000. This is a 0.7 percent reduction in funding from fiscal year 1987.

We believe that the President's proposed level of funding for the MRS program is unacceptable and unrealistic. At a time when the costs of clinical research are increasing, making it difficult for the National Institutes of Health to fund clinical trials, the VA is in a unique position to take a leadership role in this area of research, which is so important to the study of cardiovascular disease. The AHA would like to recommend that the Va medical service program receive a 10-percent increase of $224 million in fiscal year 1988.

Such an increase will allow VA investigators to continue important ongoing research as well as provide some real dollar growth in the MRS program. This real growth not only aids universities in retaining their highly qualified VA investigators but would aid in the attraction of new investigators in the VA health care system.

The attraction of bright individuals into the VA research system and their continuing research success depends on the level of congressional research appropriations.

We thank you for your attention to this presentation and hope that our recommendations would be appropriately handled.

Senator PROXMIRE. Thank you very much, Dr. Ashe.

[The statement follows:]

STATEMENT OF WARREN K. ASHE, PH.D., ON BEHALF OF THE AMERICAN HEART ASSOCIATION

I am Warren Ashe, Assistant Dean for Research at the Howard University College of Medicine and a Member of the American Heart Association (AHA). The AHA is one of the world's largest voluntary health organizations. We have active organizations in all 50 states and in Puerto Rico. Over two million volunteers join with the AHA each year to carry out its mission -- the reduction of premature death and disability from heart disease, stroke and related disorders. In accomplishing this goal we work closely with Federal research, education and prevention programs whose goals are similar in nature. I am very pleased to have this opportunity to appear before your Subcommittee to make our FY 1988 funding recommendations for the Veterans Administration's Medical Research Service (MRS) program.

Heart disease, stroke and related disorders account for almost as many deaths as all other causes of death combined. That means one out of every two Americans die of cardiovascular disease. Of the current U.S. population of approximately 236 million, over 63 million suffer from some form of these diseases -- over 57 million Americans have high blood pressure, 4.8 million have coronary heart disease; and over 1.9 million individuals have suffered a stroke. The cost associated with cardiovascular disease is astronomical. In 1987 alone this cost is estimated to be $85.2 billion for physician and nursing care, hospital and nursing home services, medications, and lost productivity due to disability.

Our ability to combat cardiovascular disease directly correlates with the level and quality of overall support of basic and clinical research and prevention efforts. Our organization continues to commit a larger portion of its resources towards research, however, we cannot have an impact on the morbidity and mortality due to heart disease on our own; adequate funding of the Federal biomedical research effort is necessary. As you may be aware, the President's budget proposals for FY 1988 for the largest Federal source of support for cardiovascular research -- the National Institutes of Health's (NIH) National Heart, Lung and Blood Institute constitutes an 11.7 percent reduction from its 1987 level of support. The Administration also has recommended a reduction in funding for FY 1988 for the VA MRS program.

Even though the Veterans Administration Medical Research Service program's support for cardiovascular research makes up a small portion of the overall Federal research contribution in this area, we believe that it deserves the strong support of the AHA and the Congress as well. In 1986, the MRS program expended approximately $10.4 million, or 7 percent of their budget, on cardiovascular research. While the primary purpose of the VA health care system as a whole is the provision of high quality health care services to eligible veterans, the research supported by the VA is part of the total biomedical research system in this country -- discoveries resulting from VA-supported research benefit science and this Nation's health as a whole.

Not only is the research supported by the VA an integral part of the overall biomedical research effort in this country, the investigators that it supports provide significant core faculty support at major medical schools affiliated with VA institutions. The MRS program provides funds to VA-based faculty members (M.D.s or Ph.D.s) at various stages in their careers; for multi-center cooperative studies (a large portion of this is for cardiovascular studies); and funds for research equipment and construction. Furthermore, the presence of a VA research program aids universities in their recruitment efforts.

This small, but highly competitive, research program supports approximately 2,800 investigators at 165 VA centers located throughout the country. While the grants they fund are "intramural" in nature, they are subject to the same type of scrutiny as are NIH "extramural" research awards. Among VA researchers there are many distinguished scientists and several Nobel Laureates. For example, in the past year numerous VA investigators have received awards for recognition of their excellent work. In the area of cardiovascular research, Dr. William H. Oldendorf, of the San Diego VA Medical Center, was awarded the AHA's Harry Goldblatt Award for his achievements in the field of hypertension research; and Dr. Stephen Kovacks, as research physicist at the Tampa VA Medical Center, was honored by the Society for Engineering in Biology and Medicine for his development of a Magnetically Activated Left Ventricular Assist Devise (MALVAD).

Examples of on-going cardiovascular research efforts funded by the VA include the following:

o a cooperative study evaluating medical vs. surgical treatment of stable angina in 636 patients. This study ranks as one of the three landmark studies in this area which has defined the indications for coronary bypass surgery, the role of medical treatment of coronary disease, the indications for coronary arteriography and the late outcome of patients treated medically and by surgery. The result has had a significant impact upon clinical practice with the saving of life and reducing the costs of medical care.

o studies into the efficacy of various medical regimes for the treatment of hypertension.

Many of these studies have provided new treatments that have resulted in great savings in drug costs, which tend to be significant over a long period of time.

o studies of the myocardial adrenergic function. Studies which elucidate the mechanisms controlling the adrenergic response of the heart to congestive heart failure are basic to our understanding of this disease process and form a logical basis for determining appropriate intervention.

o studies into the effects of active and passive smoking on endothelium and platelets. These studies will determine whether repeated episodes of passive exposure to tobacco smoke over a period of years enhance the development of atherosclerosis and its complications in nonsmokers. Preliminary research in this area has shown changes in platelet activity (increased clumping) in episodes of passive exposure to tobacco smoke.

Other areas of investigation include computer-assisted quantitation of myocardial ischemia; the study of leukocytes in acute myocardial ischemia and infarction; heterogeneity in plasma low density lipoproteins; the effect of aging on human circulation; mechanisms of clinical and experimental atrial flutter; and correlation of ischemic dysfunction and impaired hyperemic reserve.

The VA's ability to fund these and other important research projects is being undermined by the level of funds allocated to the MRS program. While the total dollars appropriated for medical research have increased since 1975 at an average annual rate of approximately 6 percent, there has, in fact, been a gradual decrease in terms of constant "1975 dollars." The FY 1987 MRS budget of approximately $170 million is less than 1.8 percent of the total VA medical care budget and less than 0.3 percent of Federal research appropriations.

The Administration has proposed a FY 1988 funding level for the VA MRS program of $172,598,000. This is a 7.7 percent reduction in funding from FY 1987. In addition, the President's proposals for the VA included the "extended availability" of funds appropriated in FY 1987 transfered from the Department of Defense from two years to four years. This proposal shows a complete lack of understanding on the Administration's part regarding the structure of the VA research program. The VA does not make multi-year research grant awards to individual researchers. As the Subcommittee knows, the VA awards its research funds on a yearly basis to its own institutions. The allocation of these funds to research projects is up to the individual institutions. We applaud the House Appropriations Committee for including language in the FY 1987 supplemental appropriations Bill disallowing this proposal. We urge its adoption by the full House and Senate.

We believe that the President's proposed level of funding for the MRS program is unacceptable and unrealistic. At a time when the costs of clinical research are increasing, making it difficult for the NIH to fund clinical trials, the VA is in unique position to take a leadership role in this area of research which is so important to the study of cardiovascular disease. The AHA would like to recommend that the VA Medical Research Service program receive a 10 percent increase, or $224.3 million in FY 1988. Such an increase will allow VA investigators to continue important on-going research as well as provide some real dollar growth in the MRS program.

This real growth will not only aid universities in retaining their highly qualified VA investigators, but will aid in the attraction of new investigators into the VA health care system. The attraction of bright individuals into the VA research system and their continued research success depends on the level of Congressional research appropriations. If some real growth is not allowed, recruitment and retention of clinician-scientists will be compromised. Trained productive staff will eventually leave, faculty burdens will shift, the resident/fellow teaching experience will suffer and possibly collapse at some centers, and the primary mission of the VA -- to provide quality medical care to the veteran -- will be severely compromised. The impact will ultimately be felt not only in clinical departments, but in basic science departments as well. The AHA urges this Subcommittee to provide $224.3 million for the VA Medical Research Service program for FY 1988. We thank you for your attention to our concerns and recommendation and I would be happy to answer any questions you may have.

STATEMENT OF DAVID HATHAWAY, M.D., AMERICAN FEDERATION FOR CLINICAL RESEARCH

MEDICAL AND PROSTHETIC RESEARCH

Senator PROXMIRE. Dr. Hathaway?

Dr. HATHAWAY. Thank you, Mr. Chairman. It is a privilege to appear before you today to speak on behalf of the Veterans Administration medical and prosthetic research appropriations for fiscal year 1988.

I am Dr. David Hathaway, professor of medicine and pharmacology at Indiana University School of Medicine and senior research associate at the Krannert Institute of Cardiology.

I might also mention I am a consulting cardiologist at the Richard Bush VA Medical Center in Indianapolis. I am here on behalf of the American Federation for Clinical Research. The AFCR is a scientific society that represents over 12,000 clinical investigators under the age of 41.

More than 5,000 such young AFCR scientists pursue careers in medical research in our nation's VA hospitals and medical schools and research institutes.

AFCR members represent all of the subdisciplines of medicine, directing their efforts toward making advances in the diagnosis and treatment in a host of common conditions which affect veterans, as well as others.

AFCR investigators are particularly aware of the vital role that VA-supported research plays in achieving progress in many areas of medical disease. My particular mission today for the AFCR is to urge your committee to reaffirm its recognition of the need for first-quality research into all of the medical problems of veterans, ranging from AIDS and drug dependence to diseases of aging.

Given the demographic characteristics of the aging veteran population, it is now clear that medical research is of equal importance. When compared to health services and prosthetic rehabilitation research, all three must be adequately supported.

It is our view that the fiscal year 1988 appropriations do not meet these needs. The President's budget has cut or frozen medical research appropriations and is a problem that is compounded by the fact that appropriations finally achieved in fiscal year 1986 and 1987 were below the level of efforts funded in fiscal year 1985.

PRESIDENT'S BUDGET INADEQUATE

The combination of cuts and lack of inflationary adjustments has resulted in decreases in both the number of good research proposals which can be funded and, of equal importance, the amount awarded to each project. The President's budget request of $195.8 million for the VA research program for fiscal year 1988 is considerably less than needed to meet the current needs of the VA efforts, let alone not realizing the potential of young VA investigators to further advance medical knowledge.

The President's budget request is only 3 percent, or $5.97 million, over the fiscal year 1987 appropriation of $192.8 million. This sum is not enough to cover planned growth and direct research projects that the CDC agent orange study or mandated epidemiologic studies such as the study of female Vietnam veterans.

Senator PROXMIRE. Can I interrupt for a moment? I am going to the floor to vote. Senator Grassley will preside in my absence. I will come back as soon as I can.

Thank you, Senator Grassley.

Go right ahead.

Dr. HATHAWAY. It will not be sufficient to cover the mandated pay raise and retirement system additions and still provide any increase in the appropriation for the real research based-effort of the VA. This budget would freeze real research expenditures for health services and rehabilitation research and allows only $1.6 million for medical research above the fiscal year 1985 appropriation, an increase which is not enough to maintain the programmatic level of fiscal year 1985 into fiscal year 1988.

We are gratified by this committee's foresight and its recommendations to the Budget Committee that increases of $10 million for AIDS research and $3 million for rehabilitation research be made. But we are, at the same time, disheartened that no increases were proposed for other investigator-initiated medical research support.

In our view, medical research is the foundation on which to build definitive therapies for those illnesses that affect our aging population of veterans. This program should receive actual growth in a carefully planned, long-range budget for the VA rather than sustaining freezes which inevitably lead to a decline in its purchasing power and programmatic scope.

I see that my time is up, and I thank you for this opportunity to speak to your committee.

[The statement follows:]

STATEMENT OF DAVID HATHAWAY, M.D., ON BEHALF OF THE AMERICAN FEDERATION FOR CLINICAL RESEARCH

Mr. Chairman and distinguished Members of the Committee,

It is a privilege to appear before you today to speak on behalf of the Veterans Administration Medical and Prosthetic Research appropriation for FY88. I am Dr. David Hathaway, Professor of Medicine and Pharmacology at Indiana University School of Medicine, and Senior Research Associate at the Krannert Institute of Cardiology in Indianapolis. I am here on behalf of the American Federation for Clinical Research (AFCR). The AFCR is a scientific society representing over 12,000 clinical investigators in this country. Active members must be clinical investigators under the age of 41. More than 5,000 such young AFCR scientists pursue careers in medical research in our nation's Veterans Administration hospitals, medical schools and research institutes. These AFCR members represent the future of medical research in this country, as evidenced by the many distinguished scientists who are active or senior members. Many of our members, like Dr. Rosalyn Yalow, winner of the 1977 Nobel Prize in Medicine and a VA scientist, are or were formerly supported by the VA in their research efforts and devote their scientific energy and expertise to addressing the medical problems of our nation's veterans. AFCR members represent all of the subdisciplines of medicine, directing their efforts toward making advances in diagnosis, treatment, or cure of patients with AIDS, Alzheimer's Disease, heart disease, cancer, aging, diabetes, kidney failure, stroke, and a host of other common conditions which affect veterans as well as others. AFCR investigators are particularly aware of the vital role that VA-supported research plays in achieving progress in many areas of medical disease. My mission today for the AFCR is to urge your committee to reaffirm its recognition of the need for first quality research into all the medical problems of veterans, ranging from AIDS and drug dependence to diseases of aging. Given the demographic characteristics of the aging veteran population, it is now clear that medical research is of equal importance with health services and prosthetic/rehabilitation research. All three must be adequately supported.

Sadly, the FY88 appropriations do not meet these needs. The President's budget has attempted to cut or freeze medical research appropriations, on top of the alarming fact that the appropriations finally achieved in FY86 and FY87 were below the level of effort funded in FY85. Such cuts and lack of inflationary adjustments have resulted in decreases in both the number of good research proposals which can be funded, and, of equal importance, the amount awarded to each project.

The President's budget request of $195.8 million for the VA Research Program in FY88 is woefully inadequate to meet the current needs of the research effort, let alone providing funds to realize the potential of young VA investigators to further advance medical knowledge. The President's budget request is only 3 percent ($5.97 million) over the FY87 appropriation of $192.8 million. This sum is not enough to cover planned growth in directed research projects such as the CDC Agent Orange study or mandated epidemiologic studies such as the study of female Vietnam veterans. It is not enough to cover the mandated pay raise and retirement system additions and still provide any increase in the appropriation for the real research base effort of the VA. This budget would freeze real research expenditures for health services and rehabilitation research and allows only $1.6 million for medical research above the FY85 appropriation, an increase, I repeat, which is not enough to maintain the programmatic level of FY85 into FY88.

We applaud your committee's foresight in its recommendations to the Budget Committee that increases of $10 million for AIDS research and $3 million for rehabilitation research be made, but we are dismayed that no increases were proposed for other investigator-initiated medical research support.

Medical research is the heart of the program dealing with the illnesses which affect our aging population of veterans. This program should be growing in any sensible long-range budget plan for the VA, NOT suffering freezes which effectively whittle away its purchasing power and programmatic scope.

The Veterans Administration merit grading system for investigator-initiated projects, after eliminating all the proposals not judged worthy of support, scores from 10 (best) to 50. In FY85, medical research projects graded by peer review to a priority score of 34 were partially funded to an average of 80% of the budget recommended by the reviewers. In FY85, an MRS budget of $171 million for medical research was necessary even to partially fund these highly rated research proposals. First and foremost, the AFCR strongly recommends a policy of fully funding research projects to the budget recommended by merit review. Only with full funding can the proposed research be properly and efficiently conducted. The AFCR recommends full funding of all meritorious research to a priority score of 30 in FY88, a more competitive score than previously funded. This score would mean that about half of meritoriously approved research projects could be funded. To achieve this level in FY88 would require $200.5 million for medical research. If $17.6 million for rehabilitation research and $8.6 million for health research are included, then the medical and prosthetic research budget for FY88 should be $226.5 million for the regular research programs only. Second, and equally important, this recommendation does not include funds for the CDC epidemiologic study, the female Vietnam veterans study, or any other directed research projects. Funds for these studies should be added to the $226.5 million, as should funds sufficient to cover the mandated pay raise and increases in federal retirement benefits (FERS) in FY88. This recommendation also does not include the sums appropriated by DoD for cooperative research. These DoD program funds should be incremental to the current services baseline of Veterans Administration medical research.

Because there are many different VA recommendations which have been proposed this year, we would like to submit 2 tables for the record. Table 1 shows the components of the research budget in a trend table, including our FY88 recommendations. Table 2 shows the dollar recommendations of the various outside groups for FY88, and carefully notes whether or not their totals include the DoD transfer or additional funds for the mandated programs added since FY85.

An appropriation of this magnitude -- $200.5 million -- solely for investigator-initiated research and its coordinated career development program, would permit the VA Medical Research Service to restore its funded research to the programmatic level of FY85. To maintain the high caliber of this research program, this programmatic level should be restored, but must then be sustained. Seeing a sustained commitment to VA medical research on the part of Congress will encourage young investigators to remain in the Veterans Administration system and utilize an expanded career development grant series to establish their careers. They would then be able to look forward to adequate funding for their research as they tackle those illnesses which afflict our nation's veterans. The AFCR urges you, Mr. Chairman, and the Members of your committee, to weigh the value and benefit to our nation's veterans of a strong and steadfast research effort based in VA hospitals. Right now, the caliber of physician recruited to staff our research-intensive, university-affiliated Veterans Administration Medical Centers is high, making the best care and the latest advances in clinical research trials and in emerging treatment modalities immediately available to the veteran patient. These studies frequently set the standards for medical care in the general population at large. The particular medical problems of veterans must receive a research focus which is not available in any other sector of the federal government or the private hospital system, and our veterans deserve the very best we have to offer.

Thank you for this invitation to testify. The AFCR is very appreciative of this opportunity to speak on behalf of its VA-based members, to support VA medical research, and in particular, to reaffirm our commitment as physician-scientists caring for our nation's veterans. I would be happy to answer any questions, Mr. Chairman.

TABLE 1

VA Medical and Prosthetic Research Budget
($$ in millions)

	FY 85 Actual	FY 86 pre-GRH	FY 86 Actual	FY 87 Appropriation	FY 88 Pres Request	FY 88 "Current Services based on FY 85 AFCR Request
Medical Research	171.0	166.5	164.3	164.3	172.6	200.5
Supplemental	-	-	-	+ 2.5	-	-
DoD fund	-	-	-	+12.0	+ 8.0	+ 8.0
All MRS funds	171.0	166.5	164.3	178.8	180.6	208.5
Rehabilitation Research	15.3	16.0	15.4	17.78	17.6	17.6
Health Services Research	6.4	6.7	6.5	8.1	8.6	8.6
Reimbursements	-	-	3.998	5.2	5.2	5.2
TOTAL RESEARCH BUDGET (excludes DoD)	192.7	189.2	190.198	197.6	204.0	231.9
TOTAL RESEARCH BUDGET (includes DoD)	192.7	189.2	190.198	209.698	212.0	239.9
CDC Study	(5.4)	-	(2.2)	(2.0)	(3.95)	3.95
Women's Study	-	-	-	-	(2.4)	2.4
FERS Retirement	-	-	-	-	(3.3)	3.3
Payraise	-	-	-	-	(3.2)	3.2
Equipment Initiative	-	-	-	-	(4.0)	4.0
TOTAL OBLIGATIONS FY 88	192.7	189.2	186.180	209.698	211.966	256.75
BUDGET AUTHORITY NEEDED FY 88	192.7	189.2	181.127	212.798 192.798	198.766	243.55

() within other budget lines, NOT additive

Table 2

ALTERNATE PROPOSALS FOR VA BUDGET FY 88

Medical and Prosthetic Research
($$ in millions)

	MRS	REHAB	HCR	Recommended Appropriation TOTAL
President's Budget FY 88 excludes DoD $$ includes directed research under MRS includes pay raise/FERS	172.6	17.6	8.6	198.8
CBO Baseline Budget includes DoD $$ includes directed research in MRS, pay raises, FERS				225.9
"Independent" Budget includes directed research and FERS/pay raises excludes DoD $$	185.1	19.6	10.8	215.5
VA Physicians includes FERS/pay raises, directed research excludes DoD $$	185.1	19.6	10.8	215.5
VA Research Admin/Investigators excludes DoD $$ excludes directed research and FERS/pay raises				223
AAMC Budget Recommendation excludes DoD $$ excludes directed research, FERS, pay raises				226
AFCR Budget Recommendation excludes DoD $$ excludes directed research, FERS, pay raises	200.5	17.6	8.6	226.7

ENVIRONMENTAL PROTECTION AGENCY

STATEMENT OF DR. PHILIP BROMBERG, AMERICAN LUNG ASSOCIATION AND AMERICAN THORACIC SOCIETY

Senator GRASSLEY [presiding]. Thank you.

I will now call Dr. Bromberg.

Dr. BROMBERG. Thank you. Mr. Chairman and members of the subcommittee, I am Dr. Philip Bromberg. I am a professor of medicine and director of the Center for Environmental Medicine at the University of North Carolina School of Medicine in Chapel Hill, and I am here on behalf of the American Lung Association and the American Thoracic Society to testify, not with respect to the Veterans Administration budget, but for the appropriation for the Environmental Protection Agency.

As is appropriate to the area of particular expertise and programmatic goals of the American Lung Association, which is America's oldest voluntary health association, I wish to focus on the EPA's air program.

AIR POLLUTION

The American Lung Association is particularly concerned that EPA target adequate resources to deal with the continuing public health problem of air pollution. EPA estimates areas in 42 of the 50 states will fail to attain the national ambient air quality standards by the end of this calendar year; that is to say, the deadline mandated by the Clean Air Act.

Inadequate ambient air quality affects one-half of all Americans exposed to pollutants that had been dignified by calling them criteria pollutants, including things like ozone and carbon monoxide and other pollutants which are less dignified but have more frightening names, since they are called toxic and hazardous compounds.

One of the so-called criteria air pollutants—ozone—is a powerful oxidizing agent. It remains a major problem, not only for health, but also for crops, for forests and for materials. There is substantial costs to the economy due to the presence of excessive amounts of ozone in the air above and beyond the health care costs which are themselves quite important.

The President's proposed budget for EPA provides less than 9 percent of the budget for the air program. It perpetuates the budget reduction for air of 8 percent, which occurred when the present fiscal year 1987 budget was adopted. These levels continue to be insufficient to support the Agency's mandate; that is, the implementation of a national strategy to control toxic compounds in the air and to attain the national ambient air quality standards.

The American Lung Association, therefore, recommends a funding level of $290 million for the air program. This does, in fact, represent a 20-percent increase above the recommended budget for 1988, but it is a 10-percent increase over the fiscal year 1986 budget for the air program in order to allow EPA to achieve its mandated objectives.

RESEARCH AND DEVELOPMENT

We are particularly concerned about the research and development portion of the air program, which nominally is proposed to receive $65 million. That is a bit more than one-fourth of the total air budget, but in fact, much less is available for the actual performance of research. The Lung Association recommends a total of $78.6 million for this part of the air program, and I would like to cite simply two specific examples with respect to research and development.

The appropriation request in R&D of $12.7 million to study health effects of hazardous air pollutants reflects no change from fiscal year 1987. Nevertheless, this particular request is also expected to support the Agency's proposed new in-house program to study the adverse health effects of fuel and fuel additives; for example, methanol, which is creating quite a stir as a means of dealing with some of the gasoline-induced problems of air pollution.

Senator GRASSLEY. Your 5 minutes are up, so we will have to have the rest of your testimony submitted for printing. I thank each of the panel members.

[The statement follows:]

STATEMENT OF PHILIP A. BROMBERG, M.D., ON BEHALF OF THE AMERICAN LUNG ASSOCIATION AND THE AMERICAN THORACIC SOCIETY

Mr. Chairman and Members of the Subcommittee, I am Dr. Philip Bromberg, Director of the School of Medicine Center for Environmental Medicine at the University of North Carolina. On behalf of the American Lung Association and the American Thoracic Society, I appreciate the opportunity to comment on the proposed FY 88 appropriation for the Environmental Protection Agency. ALA, which is America's oldest voluntary health association, and ATS, its medical section, will focus their concerns on the Agency's Air Program, and the Research and Development component within this program.

For twenty years, the ALA's air conservation program has applied its expertise and primary interest to the public health problems of air pollution. As such, the organization is especially concerned that EPA target adequate resources toward addressing the continuing public health problem -- air pollution. Recent estimates by EPA indicate that areas in 42 states will fail to attain national air quality standards by the mandated deadline in the Clean Air Act -- December 31, 1987.

The President's proposed FY 88 budget for the Air Program fails to satisfactorily address the continuing and protracted air pollution problem. The proposal would provide only $241.4 million for the Air Program, which represents only 8.9 percent of the Administration's $2.7 billion FY 88 request for EPA. The lack of growth in the Air Program budget is of particular concern since the FY 87 budget represented a 7.9 percent reduction from the FY 86 appropriated levels. The funding levels continue to be insufficient to support the Agency's mandate: the implementation of a national strategy to control toxic compounds in the air and the maintenance of an adequate level of programming to attain the National Ambient Air Quality Standards (NAAQS).

The ALA/ATS recommends a funding level of $289.7 million, a 20 percent increase, for the Air Program. We believe this level of funding will allow the EPA to achieve its program objectives and make further progress towards the goal of healthful air quality.

It is estimated that as many as one half of all Americans live in areas where the air quality is still judged "unhealthful." Ozone is a powerful oxidant and remains one of the most pervasive outdoor air pollution problems in the United States today. At ambient concentrations, often highest during warmer weather, ozone can impair human health, and damage crops, forests and certain man-made materials. According to an ALA survey, indications are that health care costs in the United States from exposure to the six "criteria" air pollutants for which EPA sets standards amount to an estimated tens of billions of dollars annually.

Research and Development

The Research and Development component of the Air Program is also a primary concern of the ALA/ATS. The President's FY 88 budget request totals $65.5 million, a 3.8 percent increase from the FY 87 level. The ALA/ATS recommends funding totaling $78.6 million. This level is needed to support an aggressive Research and Development program and ensure continuity in meeting primary program objectives.

It is anticipated that the actual appropriation for Research and Development will be $39.6 million, a 2.9% increase over the FY 87 level. Upon close examination, this appropriation request will result in reductions within certain program initiatives or at the very best a slight increase which will not keep pace with inflation. For example, the $9.9 million request for the Monitoring Systems and Quality Assurance initiative, which includes the provision of scientific support to develop and review primary and secondary NAAQS, and New Source Performance Standards (NSPS) and State

Implementation Plans (SIPS), represents a $1.9 million reduction. The ALA/ATS seriously questions the Agency's contention that many of the criteria pollutant quality assurance, and ambient and source monitoring methods are sufficiently developed to allow some phase down of support to the regulatory program. The Agency's intent to lessen the emphasis in this area is particularly unwise given the continuing problem of nonattainment throughout most metropolitan areas of the country.

The President's proposed budget provides very limited increases in a number of Research and Development initiatives within the Air Program. For example, $2.5 million is requested for Scientific Assessment, an approximate $100,000 increase. The Agency professes that this very small increase, will provide (and I quote) "enhanced support for a new focus on assessing health risks from toxic mobile source pollutants."

The 1988 Research and Development appropriation request of $12.7 million to study the health effects of hazardous air pollutants reflects essentially no change (a $28,000 increase). This particular request is also expected to support the Agency's proposed new in-house resources for the mobile sources program. EPA has indicated that its Health Effects program will include the initiation of an in-house program to study the adverse health effects of fuel and fuel additives.

One initiative necessary to improve the Agency's health effects research program is the expansion of the facilities of its Clinical Studies Branch which are situated in several small temporary buildings on the campus of the University of North Carolina Medical Center. Agreement has been reached with the University of North Carolina for the siting and construction of a permanent building to house this facility. The Clinical Studies Branch is the human subjects research arm of the Agency's Health Effects Research Laboratory. It is a unique scientific resource in which the effects of experimental exposure of human subjects to air pollutants are studied. Normal children and adults and patients with a variety of lung and heart diseases have been and continue to be studied in this facility. Approximately $1.5 million, an estimated 10% of the projected total building cost, is needed to fund the detailed architectural and engineering plans and get this building underway. The ALA/ATS urges that the FY 88 budget proposal include this amount for this purpose. The Agency's stated intent to renew their focus on health effects research would be clearly demonstrated by the provision of criticaly needed funds essential to this unique clinical research facility.

The ALA/ATS continues to be concerned that the Research and Development Program in Air has major problems. Existing limitations on the research and development budget along with current program management problems, severely impede the EPA's ability to successfully complete in an orderly manner, research activities essential to its regulatory mandate. For example, as currently structured, the Agency can obligate funds for only one year, thus limiting the type and volume of research to be initiated, and interfering with the continuity of research in progress. Moreover, at any point in the fiscal year, monies can be re-directed by decisionmakers from the Assistant Administrator for Research and Development through individual laboratory directors, to purposes other than those established originally in the adopted research program.

Other Air Program Concerns

The ALA is also concerned that other Air Program components have not received adequate budget increases to provide the necessary resources to complete mandated activity. For example, the President's FY 88 budget request for Stationary Source Enforcement is approximately $15 million, with slightly less than one-fifth of this amount, $2.9 million, targeted for the Abatement, Control and Compliance appropriation. The $2.9 million request represents a $0.2 million decrease from the FY 87 level. The Mobile Source

Enforcement request is approximately $7 million with only $2 million, less than one-third, targeted for the Abatement, Control and Compliance appropriation. The $2 million appropriation is an $0.1 million increase from the FY 87 level.

The ALA/ATS strongly urges that proposals in this area be reconsidered. Enforcement and compliance are at the very center of any continuing progress in decreasing the prevalence of nonattainment throughout the nation. While some progress has been made, there remains particular concern that mere compliance with existing emissions reduction requirements has been insufficient to reduce the compelling number of nonattainment areas. In fact, there is critical need to incorporate more stringent requirements, as well as specific annual reduction goals from stationary sources. The efficacy of such initiatives, however, cannot even be studied within the Agency with the continuous failure of the Administration to request adequate budgetary support.

Conclusion

In summary, I would remind the Subcommittee that, in essence, the President's proposed FY 88 budget for EPA leaves the Agency with resources insufficient to adequately address sorely needed priorities in the Air Program and specifically its Research and Development activities. Since 1981, the Agency has taken more than its share of budget reductions, and now the nation is paying a severe price as pervasive nonattainment continues to present serious threats to public health. It is up to the Subcommittee to reevaluate these FY 88 budget requests to meet the most compelling needs and the ALA/ATS offers its assistance in the determination of more realistic resource levels. Thank you for this opportunity to appear before the Subcommittee.

VETERANS ADMINISTRATION

STATEMENT OF FRANK R. DEGEORGE, ASSOCIATE DIRECTOR, PARALYZED VETERANS OF AMERICA

Senator GRASSLEY. I will call the next panel, Mr. Jack Powell, representing the Paralyzed Veterans of America; Mr. Stephen Edmiston, the Disabled American Veterans; Mr. James Magill for the Veterans of Foreign Wars and Mr. David Passamaneck of the AMVETS.

Senator GRASSLEY. Will you gentlemen please come forward?

Senator GRASSLEY. I think I will ask the panel to start the way I announced, and so we will start with Mr. Powell.

Mr. DEGEORGE. Senator Grassley, Mr. Powell has been detained. My name is Frank R. DeGeorge. I am associate director.

Senator GRASSLEY. Would you give your name again?

Mr. DEGEORGE. Frank R. DeGeorge. I thank the Senator. Briefly, I just want to mention that Paralyzed Veterans of America is pleased to join in with three other major veterans organizations to provide what is known as an independent budget proposal which Dr. Custis will present later on in the panel.

But the other organizations do include the Disabled American Veterans, the Veterans of Foreign Wars, and the AMVETS.

VETERANS' BENEFICIARY TRAVEL

Again, we are proud to present an independent budget. I will only point out in our presentation one area of concern amongst many for PVA, and that is the one of beneficiary travel for veterans. The VA has changed its regulations on beneficiary travel to drastically curtail eligibility for payment of veterans' travel expenses in connection with receiving VA medical care.

The regulations would allow payment only for special mode transportation and inner facility transfers. Previously, eligible veterans, who must often travel long distances from rural areas to reach the nearest VA medical facility, can no longer receive such payments, even though they may have serious service-connected disabilities.

We are concerned that many veterans entitled to receive VA medical care under Public Law 99–272 will be unavailable to avail themselves of it because they will not be able to afford the expenses of transportation. This, we believe, creates a barrier to health care which could have dire medical consequences for those veterans in most need.

We would ask this committee to ensure sufficient levels of funding for beneficiary travel and to also ensure that the committees separate the interfacility travel funding from general amounts appropriated for beneficiary travel so that those funds can be clearly identified and used by local medical centers for that purpose only.

I would yield the rest of my time to Dr. Custis in the complete statement. Thank you.

[The statement follows:]

STATEMENT OF R. JACK POWELL, EXECUTIVE DIRECTOR, PARALYZED VETERANS OF AMERICA

Mr. Chairman and Members of the Subcommittee, I am R. Jack Powell, Executive Director of Paralyzed Veterans of America, and on behalf of the members of Paralyzed Veterans of America, a congressionally chartered veterans' service organization, I want to thank you for affording me the opportunity to appear here today.

PVA appreciates the Subcommittee's efforts to conduct hearings, and for being able to express our views and concerns regarding this most important issue, the proposed Fiscal Year 1988 funding for the Veterans Administration.

All of PVA's members are veterans who have experienced catastrophic spinal cord injury or dysfunction. It is on behalf of these veterans who have considerable contact with the VA's Regional Offices and Medical Centers located throughout the United States that we present our views today.

SUMMARY

Mr. Chairman, per your request, a summary of PVA's statement is provided as follows. It reflects our total support of the "Independent Budget" for veterans' medical care, prepared jointly by the AMVETS, DAV, VFW, and PVA, and presented by Dr. Donald Custis.

Additionally, the separate statement of PVA reflects our concern for:
- °funding the appropriate VA staffing levels for the Department of Veterans' Benefits;
- °adequate funding for beneficiary travel for eligible veterans;
- °support for the House Committee on Veterans' Affairs recommendations to increase medical care funding by $30 million for the treatment of AIDS patients.

PVA also believes:
- °that the VA should refine its Facility Development Plans as recommended in a Booz-Allen Hamilton/RTKL Report on the VA Construction Program;
- °the need of adequate funding for VA medical and prosthetic research programs;
- °that additional funding be provided the VA's construction account to allow the agency to proceed on schedule with several major construction projects deleted in the Administration's proposed Budget, and PVA endorses funding for design funds for the clinical addition, renovation of Building 2 and the Spinal Cord Injury Center at the Dallas VA Medical Center;
- °the VA's current policy of denying approval for the construction of VA owned and operated nursing homes remains a serious concern as we support the House Committee on Veterans' Affairs recommendation to restore funding for the following four planned projects costing $18 million:

  - °VAMC Palm Beach: 240 Bad Nursing home (design funds)
  - °VAMC Mountain Home, Tennessee: 120 Bed Nursing Home
  - °VAMC Tampa, Florida: 120 Bed Nursing Home
  - °VAMC Wilkes Barre, PA: 60 Bed Nursing Home

INDEPENDENT BUDGET

The issues of concern to our membership are addressed in part in the statement of Dr. Donald Custis in his presentation of the "Independent Budget" for veterans' medical care. PVA is proud of its participation in this collaborative effort to devise a fair and equitable budget to meet the growing demand for quality medical care by this nation's veterans.

This "Independent Budget" was conceived in response to countless attacks by the Administration to cut veterans' programs and benefits with blatant disregard for the nation's moral responsibility to the men and women who have served. We believe that the latest effort, the Administration's Fiscal Year 1988 budget for the Veterans Administration is an overt effort to eliminate veterans' benefits and preclude veteran's access to needed services, particularly in the area of medical care.

Over the past several years, PVA has observed that budgets for the Veterans Administration have basically rendered current services, providing for no real growth in benefits and services. PVA recognizes the need to reduce the federal deficit and therefore we support the current services approach authorized by the House Budget Committee and approved by the House. However, the Budget Committee's figures, while representative of the Congressional Budget Office baseline (Fiscal Year 1987 plus adjustment for inflation) do not accommodate the true needs of the Veterans Administration with respect to the burgeoning demand for services by veterans already eligible for those services.

PVA has released a completed study titled "Veterans Health Care: Actions and Interactions" which we are pleased to submit for the Subcommittee's review. This study showed that any further reductions to the VA's Appropriations would shread the safety net that the VA health care system provides for millions of veterans.

The VA health care system is not immune from the impact of a rapidly changing public and private health care market in the United States today. And, yet the VA is rarely mentioned in discussions and studies of changes affecting the nation's health care delivery system. For this reason, PVA commissioned the interactions study to help evaluate how changes in budgets and patient demand in the VA system could not only affect veterans health care but other health systems, programs, and providers as well. Although there was almost continuous expansion in veterans' benefits and services for nearly half a century, the last decade has seen the VA's medical care budget remain essentially level in real dollar terms. In the mid-1980's veterans are observing cutbacks in funding allocations for the VA even at a time of increasing demand. PVA wanted to track the actions and interactions of this current budget climate by reviewing data from four separate VA medical districts.

Among its many findings demonstrating the interplay of the VA with other national health systems, our "Actions and Interactions" study identified one salient point: horizontal or vertical cuts in VA health care programs do not achieve true savings. Reductions in VA funding not only endanger the quality of care provided by the VA, but merely result in cost shifts to other federal, state or private health providers. Demand for health care does not diminish because funding is not available from one particular source. The study showed, as well, that alternative sources of care from other public or private providers are not realistic resources for care of the underinsured, rapidly aging, predominantly male VA client. Most recent data of VA usage under the eligibility reforms (PL 99-272), signed into law in April 1986, indicate that 94.1% of 931,000 applications for health care received by the VA through February 11, 1987 fell into the highest eligibility category for care, "Category A", which includes the service-connected, certain veterans with special eligibility, and non-service-connected disabled veterans with incomes under $15,000 per year.

These statistics clearly prove the role the VA plays in providing health care services to a deserving and in many cases near-medically indigent patient population. Particularly at a time when Congress is reviewing various proposals to design expensive catastrophic health care programs, PVA believes it is vital to weigh the immense contribution of the VA within the overall national health care mission in providing acute care and long-term care to millions of senior American veterans. In this sense, the cost and contribution of the VA should be counted as a national asset.

In an effort to reduce duplication of testimony already provided by way of the "Independent Budget," I will limit my remarks to only specific veterans' programs and services not included in that document.

DEPARTMENT OF VETERANS BENEFITS: Staffing levels for the Department of Veterans Benefits (DVB) have been under severe attack for the past several years. Most VA regional offices are struggling right now just to meet basic timeliness and quality-of-service standards. Workload within the Department must be measured not only by the number of veterans' claims pending, but also by the complexity of those cases being adjudicated on a day-to-day basis by an already overworked and overtaxed DVB staff. Any further erosion in staffing at this time, we feel, could seriously degrade the quality of ongoing adjudication services provided by the VA. Adjudication, veterans services and support staff are on the front line of benefit delivery within the VA. We will strongly support any effort made by this Subcommittee and the Congress to restore and enhance funding for these key personnel.

BENEFICIARY TRAVEL: The VA has changed its regulations on beneficiary travel to drastically curtail eligibility for payment of veterans' travel expenses in connection with receiving VA medical care. The regulations would allow payment only for special-mode transportation and intrafacility transfers. Previously eligible veterans who must often travel long distances from rural areas to reach the nearest VA medical facility, can no longer receive such payments, even though they may have serious service-connected disabilities. We are concerned that many veterans entitled to receive VA medical care under Public Law 99-272 will be unable to avail themselves of it, because they will not be able to afford the expense of transportation. This, we believe creates a barrier to health care which could have dire medical consequences for those veterans in most need.

We recommend that the Senate Committee on Appropriations assure a sufficient level of funding for beneficiary travel especially for rural veterans, seriously disabled veterans and service-connected veterans. We also recommend that the Appropriations Committee separate the intrafacility travel funding from the general amounts appropriated for beneficiary travel so that those funds can be clearly identified and used by local medical centers for that purpose only.

AIDS: PVA also supports the recommendation of the House Veterans' Affairs Committee which would increase medical care funding by $30 million for the treatment of AIDS patients. According to reports, the VA is currently treating approximately 1,000 AIDS patients. This figure will undoubtedly increase in the future. The VA estimates the cost of treating an AIDS patient at $40,000 per year. Due to the complexity of the disease, and the multiple diagnostic related groups (DAG's) governing the VA's current resource allocation system for these diseases, most VA medical centers with AIDS patients rarely receive adequate budget reimbursement for this care. PVA believes this additional funding is fully justified to help cover the enormous and growing costs of adequate treatment of veterans with AIDS.

CONSTRUCTION: The VA's budget request contains, as part of the Advance Planning Fund (ADF), an additional $10 million to begin forty (40) more Facility Development Plans (FDP). This initiative, recommended by the Booz-Allen Hamilton/RTKL Report on the VA Construction Program, is intended to improve the agency's ability to plan for the physical development and maintenance of its medical facilities. Properly implemented, this initiative will enable VA officials to make resource allocation decisions based on an assessment of current and projected facility needs, system-wide.

PVA's concern is that the FDP initiative is currently in its pilot program state and insufficient feedback has been received to justify the expenditure of $10 million in FY '88 for forty additional FDPs. The most fundamental and valuable aspect of the FDP recommendation has been neglected. Specifically, computer system data requirements for a resource allocations decision-making tool have not been defined as recommended by the BAH/RTKL Study.

In addition, the content and format for FDPs bears little resemblance to what private industry would recognize as a master facility plan. Cost proposals for the pilot FDP projects have significantly exceeded the projected costs. Substantial change and refinement of the FDP program is needed before funds are appropriated for this vitally important program.

PVA also strongly recommends additional funding be added to the VA's construction account to allow the agency to proceed on schedule with several major construction projects deleted in the Administration's budget submission. We endorse the addition of $15 million for design funds for the clinical addition, renovation of Building 2, and the Spinal Cord Injury Center at the Dallas VA Medical Center. This project has been planned for several years but continues to be deleted by the Office of Management and Budget due to fiscal restraint. The VAMC buildings in Dallas were constructed in 1939 and 1950. Severe space deficiencies and increasing demand for care at Dallas are impairing the VA's mission at this facility. We are hopeful that this project, which includes the new Spinal Cord Injury Center so vital to the needs of our membership, will not be delayed another year at additional cost to the taxpayer and inconvenience to the veteran patient.

PVA is also deeply concerned by the the VA's current policy of denying approval for the construction of VA owned and operated nursing homes. Faced with the demands of a growing senior veteran population, the VA simply cannot ignore this need. For this reason PVA encourages the Appropriations Committee to accept the recommendation of the House Veterans' Affairs Committee and restore funding for the following planned projects at a total cost of $18 million:

VAMC Palm Beach, Florida: 240 bed nursing home (design funds)
VAMC Mountain Home, Tennessee: 120 bed nursing home
VAMC Tampa, Florida: 120 bed nursing home
VAMC Wilkes Barre, PA: 60 bed nursing home

RESEARCH: PVA would like to emphasize the importance of adequate funding in the areas of medical and prosthetic research. As has been the case in prior years, when monetary funds become scarce, research activities, especially those that do not hold promise of an immediate return on investment, are curtailed or in some cases terminated. We are very concerned that the VA continue its leadership role in research and its involvement in VA/DOD cooperative research programs. PVA firmly believes that when an entity fails to seek out new knowledge, its growth and quality of services stagnate as a result. PVA wants the VA to continue to strive forward with each project having the potential of improving the quality of life for many of our members and all veterans.

With this in mind, it is essential that funding be provided to enhance the VA's Acquired Immune Deficiency Syndrome (AIDS) research initiatives. We support the House Committee on Veterans' Affairs recommendation of an additional $5 million and 125 FTEE for research related to AIDS and the continuation and enhancement of other designated high priority research projects.

CONCLUSION: In conclusion, we appreciate the fact that this Subcommittee has and will provide careful examination of the proposed funding for the VA and the needed scrutiny of the VA's programs to provide the necessary appropriations which you have done in the past. Further, we trust and continue to believe that your commitment to the veterans of this nation mirrors the intent of Congress.

Mr. Chairman, that concludes my statement. Thank you and the Members of the Subcommittee for your extremely deliberate and thoughtful considerations of this issue. I will attempt to answer any questions that I can.

STATEMENT OF STEPHEN L. EDMISTON, DEPUTY NATIONAL LEGISLATIVE DIRECTOR, DISABLED AMERICAN VETERANS

Senator Grassley. I would ask you to proceed. I am going to have to go, but Senator Proxmire will be back just within a few seconds, I am sure. I have only got 5 minutes to go cast my vote on the Senate floor. Proceed.

Mr. Edmiston. Thank you. My name is Steve Edmiston.

Senator Grassley. Here is Senator Proxmire right now.

Senator Proxmire [presiding]. Thank you. Our next witness is Stephen L. Edmiston, deputy national legislative director of the Disabled American Veterans.

Dr. Edmiston, go right ahead, sir.

Mr. Edmiston. Thank you.

Senator Proxmire. I apologize. I am sorry I wasn't here. We had a vote on cloture, so I had to be there. Go right ahead.

Mr. Edmiston. Thank you, Mr. Chairman. The DAV appreciates the opportunity to be here this morning to comment on the administration's proposed fiscal year 1988 budget request for the VA, which, as you know, seeks an increase of some $548 million over the fiscal year 1987 funding level to administer the various programs and services for this nation's veterans, their family members and survivors of deceased veterans.

ADMINISTRATION'S BUDGET REQUEST INADEQUATE

The funding request for VA's medical care account proposes an increase of some $414 million of the 1987 level. Of that amount, $393 million of the proposed increase has been specifically requested to absorb the cost of payroll increases including the cost of the 1987 civilian pay raise.

The request proposes also an additional 1,981 full-time employees to staff new occupations, yet the cumulative effect on the VA's average medical care employment levels in 1988 will be a reduction of more than 6,200 full-time equivalent employees, inclusive of the proposed fiscal year 1987 rescission.

In our view, the administration's VA medical care fiscal year 1988 budget proposal will, notwithstanding the proposed increase, only serve to further impede the VA's ability to provide quality and timely health care to this nation's entitled veterans.

In this respect, we strongly encourage the subcommittee to favorably consider the recommendations and funding levels contained in the veterans service organization's independent health care budget.

Regarding other areas of the administration's 1988 budget request for the VA, the DAV believes the construction request simply does not go far enough to accomplish what must be done to maintain the health care system capital plan. Prosthetic research continues to be unfairly treated in the distribution of research dollars. The Department of Veterans Benefits' diminished staffing levels jeopardize the VA's ability to provide needed services to beneficiaries, and the legislative proposals, with the exception of the proposed cost-of-living increase in compensation and DIC benefits contained in the budget request, only serve to dilute or eliminate entitlements brought and paid for by honorably discharged veterans.

The DAV strongly urges the subcommittee to recommend levels of funding in the fiscal year 1988 HUD and Independent Agencies appropriations measure that realistically and adequately address the needs of all veterans and the benefits and programs administered by the VA.

Thank you, Mr. Chairman.

Senator PROXMIRE. Thank you very much, Mr. Edmiston.

[The statement follows:]

STATEMENT OF STEPHEN L. EDMISTON, DEPUTY NATIONAL LEGISLATIVE DIRECTOR, DISABLED AMERICAN VETERANS

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

On behalf of the more than one million members of the Disabled American Veterans and its Ladies Auxiliary, I am pleased to have this opportunity to discuss the budget request for the Veterans Administration for Fiscal Year 1988.

Let me begin by thanking you, Mr. Chairman, and the members of the Subcommittee for permitting us to present our views on the Fiscal Year 1988 VA budget request prior to completing your work on the Fiscal Year 1988 HUD and Independent Agencies Appropriations measure.

As you know, Mr. Chairman, on behalf of the Veterans Administration, the President is requesting $27.6 billion in budget authority -- an increase of $548 million over Fiscal Year 1987 funding levels -- to administer the various programs and services for this nation's 78.5 million veterans, their family members and survivors of deceased veterans in Fiscal Year 1988.

MEDICAL CARE

The Fiscal Year 1988 budget request for the Department of Medicine and Surgery (DM&S) calls for overall budget authority in the VA's medical care account of $9.97 billion -- an increase of $414 million over the Fiscal Year 1987 level.

Mr. Chairman, in our view, notwithstanding the proposed funding increase, the VA's ability to provide quality and timely health care to America's veterans will continue to erode.

This is so in view of the fact that $393 million of the proposed increase in the medical care account has been requested specifically to absorb the cost of payroll increases, including the costs of the 1987 civilian pay raise and the 1988 Federal Employees' Retirement System (FERS).

The Administration's budget request proposes, among other things:

* treating 13,548 less veterans on an inpatient basis in VA medical centers;

* treating 113,000 less veterans on an outpatient basis;

* a projected 1% productivity increase (in reality an arbitrary 1% budgetary reduction) estimated to save $58 million and reduce full time equivalent employees (FTEE) by 1,991 in Fiscal Year 1988;

* virtual elimination of the beneficiary travel program; and

* maintaining and operating 2,600 fewer hospital and nursing home care beds than mandated by current statute.

As you may have noted, Mr. Chairman, an additional 1,981 FTEE are being proposed to staff new activations in Fiscal Year 1988. However, the cumulative effect of the Agency's average medical care employment in Fiscal Year 1988 will be a reduction of more than 6,200 FTEE (inclusive of the proposed Fiscal Year 1987 rescission).

In our view, Mr. Chairman, this Fiscal Year 1988 VA medical care budget proposal will only serve to further impede the VA's ability to provide quality and timely health care to this nation's entitled veterans.

According to all estimates, the Administration's proposed DM&S budget for Fiscal Year 1988 falls some $300 million short of the minimum funding level necessary simply to maintain veterans' health care services at current Fiscal Year 1987 levels.

The full Senate has adopted a funding level for the medical care account which falls approximately $175 million below that which was recommended by the Senate Veterans Affairs Committee. In our view, the funding level reported by the Veterans Affairs Committee was more realistic in terms of allowing the agency to continue to provide quality and timely health care services to eligible disabled veterans.

Mr. Chairman, we encourage you and members of the Subcommittee to carefully scrutinize the Fiscal Year 1988 funding levels proposed for the VA medical care account. We believe such scrutiny will lead you to propose a realistic and meaningful funding level that will, at the very least, enable the Agency to provide health care services to those veterans so entitled.

In this respect, Mr. Chairman, we would further urge you to carefully consider the recommendations and funding levels as contained in the Independent Health Care Budget for Veterans which has been provided to the Subcommittee. This budget document represents the cumulative and cooperative efforts of several major veterans' service organizations (AMVETS, DAV, PVA and VFW) and represents, in our view, a realistic funding level that would allow the Agency to carry out its mandated mission of providing health care services to disabled veterans.

MEDICAL & PROSTHETIC RESEARCH

Mr. Chairman, the Administration's Fiscal Year 1988 medical and prosthetic research request is $198.7 million ($14 million below the Fiscal Year 1987 funded level).

The DAV has, and continues to be, fully supportive of the VA's combined research efforts. It is discouraging, however, to continue to witness the large disparity in the funding levels for medical research ($185.8 million) and that requested for prosthetic research ($17.6 million). The DAV supports the mission of Health Services Research and Development and we are encouraged by and support the funding requested. Likewise, we support the request for $2.4 million to fund an epidemiological study of women Vietnam veterans and the $4 million requested to continue to support the ongoing Agent Orange epidemiological study.

CONSTRUCTION

As you know, Mr. Chairman, the VA's Fiscal Year 1988 program level request for construction is $525.7 million, some $60 million above the Fiscal Year 1987 level.

Of the total program level, approximately $449 million will be devoted to the VA health care system.

Highlights of the medical construction program include:

- $190.1 million for replacement and modernization projects;
- $33 million for general and miscellaneous projects to accomplish certain renovations, modifications, remodeling and other general improvements for support systems;
- $95.4 million for clinical improvements;
- $28.9 million for fire and safety improvements;
- $4.5 million for nursing home improvements;
- $28.1 million for outpatient improvements;
- $14.2 million for the design fund;
- $18.5 million for the advanced planning fund; and
- $11.1 million for the domiciliary program.

Simply stated, while we support full funding of the proposed construction program, we are nevertheless concerned, not only with the quality of care currently being provided, but also about the VA's ability to meet the pressing demands being placed upon its health care system.

We know that greater numbers of elderly veterans are seeking nursing home care from the VA, yet, of this medical construction budget, less than 1% ($4.5 million in the minor construction account) is requested for nursing home care bed conversion, renovation and relocation.

We support the VA's proposal to convert 282 hospital beds to nursing home care beds. However, as demand for nursing home care beds rapidly increases, we would urge the VA to direct greater attention to the conversion of beds already closed (or to be closed) to nursing home care beds.

Mr. Chairman, OMB and the VA continue to clearly circumvent the law (Section 5010(a)(1), Title 38, United States Code). In Fiscal Year 1988 the VA proposes to operate 2,613 fewer beds than that which is required by law.

The DAV has an inherent interest in the maintenance of VA hospital beds for the care and treatment of all eligible veterans. Yet, the Fiscal Year 1988 budget projects the loss of 1,165 hospital beds. This reduction will bring the total loss of hospital beds within the confines of the system to some 7,000 since 1982. Conversely, the VA has added only 3,400 nursing home care beds to the system over the same period, a net loss of 3,600 beds since 1982.

Mr. Chairman, the VA construction request for Fiscal Year 1987 simply does not go far enough to allow the VA to accomplish what must be done if the health care system capital plant -- which represents a multi-billion dollar investment on the part of the American taxpayer -- is to remain viable.

DEPARTMENT OF VETERANS BENEFITS

The VA's Fiscal Year 1988 request for the Department of Veterans Benefits (DVB) totals $551 million, an increase of $33.4 million over the Fiscal Year 1987 level. We are concerned, however, that average employment in DVB will decrease by some 296 FTEE in critical areas such as compensation, pension and education services, veterans' services, support services and vocational rehabilitation and counseling services.

Mr. Chairman, since 1980 some 4,900 employees have been slashed from DVB and, today, each regional office is barely staffed at minimum levels to adequately respond to the workload and demands for services placed upon it from veterans and their dependents.

We have grave concerns about the VA's ability to continue to provide needed services to beneficiaries and the proposal to reduce average employment will only serve to further curtail the services that the VA is charged to provide.

VETERANS JOB TRAINING ACT

As you are aware, Mr. Chairman, Public Law 98-77, the "Emergency Veterans Job Training Act of 1983," established a program of job training assistance directed toward Korean Conflict and Vietnam Era veterans. Since its inception, this program has been responsible in assisting over 50,000 long term unemployed veterans to return to the work force.

In view of the proven effectiveness of this program, we are pleased to support the recommendation of the Senate Veterans Affairs Committee to extend the program and provide adequate funding over the next two fiscal years.

AUTOMATED MEDICAL INFORMATION SYSTEMS

Mr. Chairman, the DAV recognizes the critical need to automate VA medical centers with information systems that will provide timely and cost-effective automated data processing (ADP) technology and resources to support and enhance clinical and administrative functions at the facility level and management functions at all levels. Our overriding concern in this regard is enhanced patient care.

In an effort to better understand the VA's progress, as well as the obstacles encountered in this process, the DAV conducted site surveys at VAMCs Saginaw, Michigan; Allen Park, Michigan; Hines, Illinois; Philadelphia, Pennsylvania; and Tampa, Florida, during March 1987. The purpose of these surveys was quite simple: to determine the capabilities of the Decentralized Hospital Computer Program (DHCP) and the Integrated Hospital System (IHS) to provide enhanced patient care.

Following our analysis of both systems, we are of the firm opinion that DHCP is certainly capable of meeting the needs of the VA and, specifically, the Department of Medicine and Surgery.

Therefore, we recommend and support full and adequate funding of the agency's appropriation request that will enable them to move forward toward full automation of their medical facilities.

Additionally, as there appears to be an urgent need for the VA to install additional hardware to support the necessary software required for more clinical and administrative applications to become functional, we support the VA's plans to obligate Fiscal Year 1987 appropriated funds for the purchase of additional needed equipment.

PROPOSED LEGISLATION

The Administration's Fiscal Year 1988 budget request proposes legislation that would provide for (1) an increase of 3.5% in the rates of disability compensation and Dependency and Indemnity Compensation (DIC), effective December 1, 1987; (2) index compensation benefits to the annual change in the Consumer Price Index; (3) change current law to provide that the VA plot allowance be paid only in the case of those veterans who were either in receipt of VA compensation or pension benefits at the time of death or to wartime veterans who died without sufficient resources for burial; (4) increase the user fee on VA guaranteed home loans from 1% to 2.5%, effective June 1, 1987; and (5) amend current law to permit lender/borrower negotiated interest rates on VA guaranteed home loans.

Mr. Chairman, the DAV is pleased with and fully supports the Administration's proposed cost of living adjustment in the rates of disability compensation and DIC benefits -- in recognition of the special consideration service-connected disabled veterans and their survivors should be given.

As strongly as we support this rate increase, we adamantly oppose any effort to index compensation benefits to the annual change in the Consumer Price Index.

Additionally, we view the initiative to "standardize" the eligibility for the VA plot allowance as simply another example of an Administration effort to repeal an entitlement that has been bought and paid for by honorably discharged veterans. Accordingly, the DAV opposes this legislative proposal.

Mr. Chairman, the Administration is proposing several legislative changes to the current VA Home Loan Guaranty Program. Of particular concern to most veterans are the proposals that would increase the user fee from 1% to 2.5% and remove the Administrator's authority to set the interest rates for such home loans. The DAV opposes both of these proposals.

CONCLUSION

In closing, Mr. Chairman, in addition to the views we have already set forth with respect to the VA's proposed Fiscal Year 1988 budget request, I want to further emphasize and underscore our very serious concern for the VA health care system and the devastating effect the Administrations' budget (if approved as proposed) spells for those eligible veterans who rely on the system for medical care.

We urge the Subcommittee to favorably recommend to your colleagues in the United States Senate levels of funding in the Fiscal Year 1988 HUD and Independent Agencies Appropriations bill that realistically and adequately address the needs of all programs administered by the VA.

At the very least we urge a recommendation at a level not less than the $28.0 billion in budget authority and $27.4 billion in outlays as passed by the Senate on May 6, 1987 (S.Con. Res. 49). Funding at this level would represent, in our view, the absolute bare-boned minimum that would permit the VA to provide mandated services and benefits to this nation's veterans, their survivors and dependents.

Again, Mr. Chairman, I wish to thank you and the members of the Subcommittee for providing us this opportunity to express our views on this most important subject.

STATEMENT OF JAMES MAGILL, DIRECTOR, VETERANS OF FOREIGN WARS

Senator PROXMIRE. Mr. James Magill, director of the Veterans of Foreign Wars.

Mr. MAGILL. Thank you, sir. We are also very proud to have been a part of the veterans independent budget, and Dr. Custis will articulate the values of the veterans organizations. I would like to just take a moment to discuss one special concern.

RECRUITMENT AND RETENTION OF HEALTH CARE PERSONNEL

The Veterans of Foreign Wars is very concerned about the VA's ability to recruit and retain VA health care personnel. While it appears the recruitment and retention of VA doctors is not causing too much of a problem, there is a severe problem in recruiting and retaining allied health care personnel.

Of this group, nurses, pharmacists, and therapists are at a critical level. While pay is certainly a concern, we are finding that working conditions, in-service training, tuition reimbursement, and work scheduling are many of the factors being weighed by those people when they are deciding to work for the VA or stay with the VA.

We hope your committee joins us in recognizing that the VA must be competitive with the private sector in the allied health care field and that a quick fix is not the answer. The VA must have adequate funding to approach this problem on a long-term solution.

This concludes my remarks, sir.

Senator PROXMIRE. Thank you, Mr. Magill.

David Passamaneck?

STATEMENT OF DAVID PASSAMANECK, LEGISLATIVE DIRECTOR, AMVETS

Mr. PASSAMANECK. Thank you, Mr. Chairman.

Senator PROXMIRE. You represent the AMVETS, is that right?

Mr. PASSAMANECK. Yes, sir. AMVETS is also proud to join with our brother service organizations in formulating and presenting this unique, independent budget, the details of which are set forth in the statement of the distinguished former Chief Medical Director of the Veterans Administration, Dr. Custis.

VETERANS' PROGRAMS HIGH PRIORITY

We would urge the Subcommittee and the Congress, in considering this budget proposal and, indeed, in comparing it with the administration's budget, to keep in mind a principle which cannot be repeated too often: That the cost of veterans programs is a continuing cost of war incurred in the calls of national defense and a far higher priority than all other budgetary categories except current defense requirements.

If we can afford, for example, approximately $29 billion a year for foreign programs of doubtful efficacy, then we should not quibble about the extremely modest proposal which we are presenting today.

Thank you.

Senator PROXMIRE. Thank you, sir.

Dr. Donald Custis.

Dr. Custis, you represent just about everything: PVA, Disabled Veterans, AMVETS, and VFW. We are happy to have you here.

STATEMENT OF DR. DONALD CUSTIS

SUBMISSION OF INDEPENDENT BUDGET

Dr. CUSTIS. Thank you, Mr. Chairman. It has been my pleasure to serve as consultant to the service organizations in their development and to present a 5-minute overview of that budget. The unprecedented action of the four veterans service organizations collaborating on the production of an independent budget for veterans health care is predicated on several concerns of such magnitude that a reactive response to OMB budget decisions has seemed no longer sufficient.

Those concerns, in fact, became the major issues, including the shape and the character of this budget. They include the avoidance of such arbitrary detrimental budget gimmickery as commonly used by OMB, the establishment of a valid current services baseline, a realization of the alarming lag in revamping the VA medical facilities and programs to meet the needs of an ever-aging veteran population, and an appreciation of the actions and interactions among the different sectors of the nation's pluralistic health care system.

In the interest of time, I would like to concentrate on just two issues: The need for accuracy in defining current services budget level and the nature of the relatively few initiatives we have proposed in the independent budget.

First is the meaning of current services and what components it properly entails. As a baseline concept, it is important because any reduction in that baseline results in the absorption of health care benefits to patients. Simply stated, for fiscal year 1988, current services refers to the fiscal year 1987 service level augmented by the true activations requirement of previously accomplished construction projects and other uncontrollable items; namely, funding for pay raise, Federal employees retirement, and health benefits program.

Estimated costs of these items in fiscal year 1987 is $316 million in supplemental appropriations. For fiscal year 1988 for these same items, plus inflation and activations adds an additional $554 million to the fiscal year 1987 level, just to stay where we are, for a combined $861 million above the fiscal year 1987 appropriation level.

Thus, over two-thirds of the dollar increases we proposed are not for program expansions but are required merely to keep even with rising costs. The President's proposed fiscal year 1988 budget falls short by $450 million of providing for current services and calls for a personnel reduction of almost 6,000 FTE.

Incidentally, even the Budget Committee baseline consists of the fiscal year 1987 appropriation level adjusted only for inflation and does not, therefore, accommodate the true numbers required to maintain current services, especially in view of the increased entitlement to veterans health care mandated by Public Law 99–272 and cuts in Medicare and Medicaid which impact the VA system.

We feel that it is crucial to provide at least the same level of service rendered the previous year. And because of the aging imperative and the ever-increasing demand for VA health care services, we also propose certain initiatives to enable the VA system to adapt to the alternate modalities of care overtaking the nation's health care scene, notably, the noninstitutional, more cost-effective ambulatory and long-term care programs.

STEPS TOWARD 1990 TARGET

Most of the initiatives represent steps toward targets for 1990. These targets and the initiatives they engender are shown in our expanded statement submitted for the record. We have the targets from the CBO analysis of the aging veteran impact and the VA study, "Caring for the Older Veteran."

In adopting those targets, we have been conservative in three ways: We have taken the lower end of the range of the 1990 estimates; we have planned to meet targets through innovative economical means; and finally, our initiatives are far short of the steps that would be needed to assure full accomplishment by 1990.

In our judgment, that would have been too costly in this time of budget restraint. The compensatory increase in resource commitment during intervening years, however is a factor.

Senator PROXMIRE. Could you summarize, Dr. Custis, and wind it up?

Dr. CUSTIS. If the targets of 1990 are to be met.

I will conclude my statement with that, Mr. Chairman. I thank you.

[The statement follows:]

STATEMENT OF DR. DONALD CUSTIS, ON BEHALF OF THE AMVETS, DISABLED AMERICAN VETERANS, PARALYZED VETERANS OF AMERICA, AND VETERANS OF FOREIGN WARS

This is a veterans' budget for veterans. The AMVETS, Disabled American Veterans, the Paralyzed Veterans of America and the Veterans of Foreign Wars have joined in an unprecedented common effort to develop and propose to the Congress an independent FY 1988 budget for veterans' health care. Ours is a proactive effort to place on the record the perspective of the Congressionally-chartered consumer representatives of our nation's veterans.

The strategy. Several forces shape our proposal (Figure I). For one, the workload of the VA health care system will increase because of newly-legislated eligibility changes, the aging of the veteran population, the growing number of uninsured and medically indigent Americans, and the decreasing willingness of the private sector to provide uncompensated care. Also, the dollars required to maintain the VA system as it stands, with no increase in treatment capacity, will increase substantially over time due to inflation, routine payroll related increases and commitment made to activate facilities under construction (Figure 2). In addition, this is a period of fiscal austerity with unprecedented federal budget deficits. The confluence of these forces requires the VA health care system to meet the challenge of a growing workload innovatively, optimizing resource use while also forging ahead in its missions in research, education of health care professionals, and provision of backup capacity to DOD in the event of military action.

A key feature of our strategy is to expand outpatient care in order to treat illness at the earliest point in time and to reduce the need for far more costly inpatient care. We propose a similar strategy for long-term care, where our emphasis on non-institutional modalities of care calls for expansion of innovative treatment methods such as hospital-based home care, geriatric evaluation units, and community residential care. Implementation of this general strategy now will result in considerable savings for the VA system over the long run.

Our inpatient strategy takes advantage of reductions in hospital length of stay by converting unneeded acute care beds to extended care use. However, we recommend maintaining most acute care staffing because an increase in staff per occupied bed is necessary to achieve the shorter stays. Extended care staff must be increased, and we recommend an emphasis on mid-level practitioners such as physician assistants and nurse practitioners. As well, it will be necessary to increase nursing home capacity with both new VA nursing homes and an expansion of the subsidized State nursing home program and the contract community nursing home program.

Current services. Figure 3 shows the funding we recommend in the five appropriation accounts into which the VA health care budget is divided. Figures 4 and 5 indicate most of the dollar increases we propose are not for program expansions, but are required merely to keep even with rising costs. Enacted appropriations for VA health care for FY 1987 are $9,686 million, but over $300 million more in supplemental appropriations are required to maintain the envisaged level of VA health care activity throughout FY 1987. Over 90 percent of this supplemental amount is needed to fully fund the 3 percent federal employee pay raise of January 1, 1987, and the increased contribution required by the Federal Employees' Retirement System (FERS). The pay raise and FERS increase cost DM&S money, but do not bring it any added resources. If supplemental funds to cover these costs are not appropriated, DM&S will have to cut employment below the level Congress envisaged when passing the basic appropriations for FY 1987. That translates into reduced services. Nonpersonnel accounts cannot realistically absorb $300 million in cuts. These accounts are already severely strained by the $72 million that had to be absorbed in FY 1987 in order to maintain staffing and beneficiary travel funds. The strain shows in the $500 million plus backlog of needed equipment from which DM&S suffers.

As Figure 4 indicates, the FY 1988 current services level is, in turn, more than $500 million above the FY 1987 level, with most of the $500 million required for payroll-related increases and inflation. It should be noted that the payroll-related increases are predominantly for a further increase in required FERS contributions. Nothing is included for an FY 1988 pay increase, for we have felt we should not singlehandedly overturn the budget formulation rule that out-year pay increases are not included in the budget.

The FY 1988 current services level includes $205 million for activation of facilities whose construction will be completed in FY 1988. This covers both equipment and an increase of approximately 2,300 FTEE in personnel. Activations are included in current services because the alternative to equipping and staffing facilities -- namely, leaving newly-constructed or newly-renovated facilities empty and unused -- is absurd, particularly in a system suffering from the aging of so many of its facilities. Activations do provide some increase in treatment capacity -- about ½ of 1 percent for both inpatient and outpatient care, judging from recent years -- and we have taken this into account in sizing the initiatives we propose.

The primary point to remember about current services is that it will take an increase of more than $800 million over enacted appropriations for FY 1987 in order to provide in FY 1988 the level of services envisaged when these appropriations were made for FY 1987 (see Figure 5). This increase of over $800 million is more than twice the amount we propose for initiatives. Thus, the main cause of spending increases in our independent budget is keeping even with rising costs, not expansion of services.

In short, the budget we present to you today is very much a fiscally conservative one, honed down to the bare necessities for meeting the VA's role now and making some modest commitments to prepare the VA for the immediate future.

Initiatives. As Figures 4 and 6 show, the initiatives we recommend total just over $400 million. Almost $370 million of the cost of the initiatives is in the Medical Care appropriation, which provides 97 percent of VA health care funds. Our initiatives in Medical Care are sized according to the growth to be expected solely from the aging of the veteran population, without allowance for an increase in demand from the approximately 10 million "Category A" veterans newly-entitled to VA inpatient hospital care under Public Law 99-272. VA data to date does not show a large expansion in demand from this group. Although we suspect problems in the data, we have been fiscally conservative and thus have not built in an increase from this source. However, as these veterans learn of their entitlement more of them will seek VA care. Similarly, as public programs and private hospitals learn of the entitlement, they will send more and more uninsured veterans to the VA. Thus we call upon the Congress to be ready to appropriate additional funds if additional demand, due to the Public Law 99-272 expansion of entitlement, does occur in FY 1987 or FY 1988.

The major initiatives (see Figures 4, 7 and 8) that we propose in the medical care appropriation are:

- Expansion of extended care both in innovative programs and in nursing homes at a net cost of $108 million and an addition of 360 FTEE. Although we are shifting the balance of extended care toward innovative programs, most of the cost increase, nonetheless, is for nursing homes. We note that many states have a freeze on private nursing home construction and are disinclined to expand or establish state veterans' nursing homes. Thus, in the long term, much of the VA's expansion in nursing home census must come from the VA's own nursing homes. We recommend construction funding for 12 VA nursing homes this year to provide some of the needed expansion in capacity.

- Provision of 400 thousand additional outpatient visits, an increase of just over 2 percent, at a cost of $30 million and with an increase of 600 FTEE.

- An increase of approximately 2 percent in the number of inpatients treated at a cost of $75 million and with a staffing increase of almost 1900 FTEE.

- An increase of $11 million in funds for continuing education to keep VA staff up-to-date with the many and rapid changes that take place in health care. These funds have been severely eroded in the last decade while the rapid changes in care continue.

- An increase of 200 FTEE and $9 million in traineeships to augment VA house staff and VA recruiting ability in specialties in which the VA is plagued by particularly severe staff shortages.

- $50 million for ADP equipment as part of a multi-year effort to bring the VA health care system up to date in data processing after years of starvation. We caution against plans that we understand the VA has to change the nature of the computer system in mid-stream. We fear that a major change made now may lead to a breakdown in the ADP development program.

- $90 million to restore funds for reimbursements to patients entitled to payment of their costs of travel to and from VA medical centers and for the costs of transferring patients between VA health care facilities.

Our proposed initiatives in Research, as shown in Figures 4 and 9 include:

- Augmentation of rehabilitation research by $3 million to a total of $20 million in FY 1988. Rehabilitation research is a field in which the VA has a national leadership role and a special obligation to the millions of veterans with disabilities, many of them service-connected.

- An addition of $2 million to health services research. Health services research is directed at improving the effectiveness and efficiency of the health care system. the $11 million total recommended is about 1/10 of one percent of the VA health budget, a very small sum in this era of tight budgets when inefficiency is least tolerable.

- An increase of $4.6 million in medical research. Most VA medical research is carried on by clinicians and thus has a high relevance to the particular needs of veterans and VA patients.

Staffing at the Washington headquarters of the VA health care system has been cut by almost one-third in recent years. We are concerned that this leaves inadequate staff for sound management, particularly in an era when waste due to mismanagement can least be tolerated. Thus, we recommend a study of Central Office staffing and organization. In the Medical Care and Miscellaneous Operating Expenses (MAMOE) appropriation, we also recommend (as shown in Figures 4 and 10):

- Reactivation of the health professionals scholarship program in nursing and other shortage professions with $6 million in FY 1988. The program has provided an important assist in dealing with the VA's nursing shortage problem.

- Funding of a new, legislatively-mandated quality assurance system that will focus on patient care outcomes and quantitative data.

Finally, we recommend an increase of over 40 percent in grants to states for construction of extended care facilities. The state-sponsored veterans' nursing homes that these grants help to build provide care to veterans at a very low cost to the VA. A major component of our extended care strategy is to take full advantage of states' willingness to expand the network of these homes. The increase in funds recommended for FY 1988 is based upon "pre-applications" already received from states.

We recommend these initiatives as the minimum necessary for the VA to contain costs, to improve its efficiency, to continue to play its role in meeting the increasing care needs of those who served their nation in the armed forces, to maintain quality of care, and to fulfill its missions in research, health professionals training, and DOD backup.

FIGURE 1

THE ISSUES

- AGING VETERAN
- BUDGET FORMULATION PRACTICES
- HEALTH CARE SYSTEMS INTERACTIONS
- ADVANCES IN TECHNOLOGY

FIGURE 2

THE UNCONTROLLED ENVIRONMENT

- PAY INCREASES
- FEDERAL EMPLOYEES RETIREMENT SYSTEM
- INFLATION
- ACTIVATIONS
- TECHNOLOGY ADVANCEMENT

FIGURE 3

MEDICAL APPROPRIATIONS AND FUNDS

SUMMARY OF APPROPRIATION REQUIREMENTS
(dollars in thousands)

Appropriation Account	1987 Enacted Appropriation	1987 Current Services	1988 Current Services	1988 Recommendation	Increase(+) Decrease(-) from '87 appropriation
Medical Care					
obligations		$9,780,817	$10,315,971	$10,684,455	
minus reimbursement		60,000	60,000	60,000	
appropriation	$9,411,817**	9,720,817	10,255,971	10,624,455	+ 1,212,638
Medical and Prosthetic Research					
obligations	189,915*	201,915	212,124	220,674	
minus reimbursement		5,200	5,200	5,200	
appropriation		196,715	206,924	215,474	+ 25,559
Medical Administration and Miscellaneous Operating Expenses:					
Medical administration	41,194	42,426	42,624	43,974	+ 1548
Postgraduate and inservice training	...	...	...	...	
Health professional scholarship	...	...	...	6,000	
Subtotal	41,194	42,426	42,624	49,974	+ 8,780
Grants for Construction of State Extended Care Facilities	42,400	42,400	42,400	60,000	+ 17,600
Grants to the Republic of the Philippines	500	500	500	500	-0-
Total	$ 9,685,026	$10,002,858	$10,548,419	$10,950,403	+ 1,264,577

*Excludes 20 million DOD transfer.

FIGURE 4

RECOMMENDED DEPARTMENT OF MEDICINE AND SURGERY BUDGET
(dollars in thousand)

FY 1987	Enacted Appropriations*		$ 9,685,826
FY 1987	Estimated Obligations (+$65,200 Reimbursements)		9,751,026
FY 1987	Supplemental Funds Required		
	Payroll Increases		132,524
	Health Benefits		27,641
	Federal Retirement System		156,867
FY 1987	Current Services Level		10,068,058
FY 1988	Payroll Related Increases		348,307
	Inflation		182,650
	Facility Activations		205,000
	Decreases in Capital Investment		(199,000)
	Other		8,604
FY 1988	Current Services Level		10,613,619
FY 1988	Initiatives		
	Medical Care		
	Extended Care	108,000	
	Inpatient Hospital Care	75,602	
	Outpatient Care	30,000	
	Continuing Education	11,200	
	Traineeships	9,000	
	ADP Equipment	50,000	
	Beneficiary Travel	30,000	
	Interfacility Transport	60,000	
	Other (net)	(5,318)	
	Total Medical Care		368,484
	Medical and Prosthetic Research		
	Rehabilitation Research	3,000	
	Health Services Research	2,000	
	Medical Research	4,600	
	Other (net)	(1,050)	
	Total Medical and Prosthetic Research		8,550
	MAMOE		
	Management Study	150	
	Health Professional Scholarship	6,000	
	Quality Assurance System	1,200	
	Total MAMOE		7,350
	Grants for Construction of State Extended Care Facilities		17,600
	Reimbursements		(65,200)
FY 1988	Recommended Appropriation		$10,950,403

*Excludes $10.4 million from HHS transfer.

FIGURE 5

RECOMMENDED DEPARTMENT OF MEDICINE AND SURGERY BUDGET

(DOLLARS IN THOUSANDS)

• FY 1987 ENACTED APPROPRIATION*	$ 9,685,826
• FUNDS TO MAINTAIN 1987 SERVICES	+ 862,593
• INITIATIVES	+ 401,984
• TOTAL FY 1988 RECOMMENDED APPROPRIATION	$10,950,403

*EXCLUDES HHS TRANSFER OF $10.4 MILLION

FIGURE 6

MEDICAL CARE

(DOLLARS IN THOUSANDS)

1987	APPROPRIATION	9,411,817*
	REIMBURSEMENTS	60,000
	ADDITIONS REQUIRED	309,000
1987	CURRENT SERVICES LEVEL	9,780,817
	PAYROLL INCREASE	339,000
	OTHER UNCONTROLLABLES AND MISCELLANEOUS	196,154
1988	CURRENT SERVICES LEVEL	10,315,971
	INITIATIVES	+368,484
	REIMBURSEMENTS	(60,000)
1988	RECOMMENDED APPROPRIATION	10,624,455

*EXCLUDES $10.4 MIL FOR HHS TRANSFER

FIGURE 7

MAJOR PROGRAM TARGETS

	FY 1987	FY 1988 NEED	1990 TARGET
• HOSPITAL PATIENTS TREATED	1,309.0 K	1,349.0 K	1.7 MIL
• VA NURSING HOME - ADC	11.0 K	12.5 K	15.5 K
• COMMUNITY NURSING HOME - ADC	12.0 K	15.0 K	19.0 K
• AMBULATORY CARE - VISITS	18.5 MIL	18.9 MIL	23.4 MIL
• INNOVATIVE LTC PROGRAMS			
- HOSPITAL BASED HOME CARE (VA)	52	65	76
- GERIATRIC EVALUATION UNITS	60	80	172
- RESPITE CARE PROGRAM	1	41	172
- ADULT DAY HEALTH CARE (VA)	8	20	76
- GERIATRIC RESEARCH EDUCATION AND CLINICAL CENTERS	10	13	25

FIGURE 8

FY 1988 EXTENDED CARE INITIATIVES
(DOLLARS IN THOUSANDS)

• VA NURSING HOME	($23,000)
• COMMUNITY NURSING HOME	+81,700
• HOSPITAL BASED HOME CARE PROGRAMS	+ 3,512
• ADULT DAY HEALTH CARE PROGRAMS	+ 8,091
• COMMUNITY RESIDENTIAL CARE PROGRAMS	+ 1,779
• GERIATRIC EVALUATION UNITS	+ 2,884
• GERIATRIC RESEARCH EDUCATION AND CLINICAL CENTERS	+ 7,482
• RESPITE CARE PROGRAMS	+ 309
• HOSPICE CARE PROGRAMS	+ 2,472

FIGURE 9

MEDICAL AND PROSTHETIC RESEARCH

(DOLLARS IN THOUSANDS)

1987	APPROPRIATION	189,915
	REIMBURSEMENTS	5,200
	ADDITIONS REQUIRED	6,800
1987	CURRENT SERVICES LEVEL	201,915
	PAYROLL INCREASE	7,959
	OTHER UNCONTROLLABLES AND MISCELLANEOUS	2,250
1988	CURRENT SERVICES LEVEL	212,124
	INITIATIVES	+8,550
	REIMBURSEMENTS	(5,200)
1988	RECOMMENDED APPROPRIATION	215,474

FIGURE 10

MEDICAL ADMINISTRATION AND MISCELLANEOUS OPERATING EXPENSES

(DOLLARS IN THOUSANDS)

1987	APPROPRIATION	41,194
	ADDITIONS REQUIRED	1,232
1987	CURRENT SERVICES LEVEL	42,426
	PAYROLL INCREASE	1,348
	OTHER UNCONTROLLABLES AND MISCELLANEOUS	(1,150)
1988	CURRENT SERVICES LEVEL	42,624
	INITIATIVES	+7,350
1988	RECOMMENDED APPROPRIATION	49,974

QUALITY ASSURANCE SYSTEM

Senator PROXMIRE. Thank you. I have a question for you, Dr. Custis. I want to thank you for presenting the independent health care budget for veterans. As you say, this is a budget developed by veterans and for veterans to be a useful document when the subcommittee takes a final notch into the VA's budget next year. You mention a new initiative on page 5 of your statement, "A new, legislatively-mandated quality assurance system that will focus on patient care outcomes and quantitative data."

What is your time frame for that new proposal? Has it found sponsorship in the authorizing committee? This is the Appropriations Committee. How about the authorizing committee.

Dr. CUSTIS. Page 5, did you say?

Senator PROXMIRE. Yes, sir; page 5.

Dr. CUSTIS. The Department of Medicine and Surgery, under encouragement by the Congress, has embarked on a very ambitious quality assurance system matching that is going on in the private sector now and also in military medicine.

It will require considerable personnel over and above what have been previously used for quality assurance.

Senator PROXMIRE. My question is: When do you think we can work that in? Or should we try to work it in? What should be the target for the time of putting this into effect?

Dr. CUSTIS. It is already in effect. This is not a proposal of the independent budget. This is a recognition on the part of the independent budget that the resources to fully implement the NSF's quality assurance are not in the President's budget.

Senator PROXMIRE. Let me ask the other part of my question. How about the support in the Senate authorizing committee?

Dr. CUSTIS. It was both the Senate and the House authorizing committee that urged the Department of Medicine and Surgery to institute a quality assurance program.

Senator PROXMIRE. What is the authorizing committee's estimate this would add to the budget?

Dr. CUSTIS. I don't have that off the top of my head. I will have to supply it for the record.

Senator PROXMIRE. Thank you very much. I appreciate your testimony.

ADDITIONAL PREPARED STATEMENTS

We have received several additional prepared statements which, without objection, will be inserted into the hearing record at this point.

[The statements follow:]

STATEMENT OF THE AMERICAN DIABETES ASSOCIATION

The American Diabetes Association (ADA) is pleased to have the opportunity to submit its views on Fiscal Year 1988 appropriations for the Veterans Administration (VA). The ADA is the nation's leading voluntary health association concerned with finding a preventive and cure for diabetes, providing information and support to the 11 million Americans who have the disease, and educating health professionals and the general public about the seriousness of diabetes.

Diabetes is a particular problem among the veteran population and is especially prevalent among VA patients. The ADA has long recognized the uniquely valuable ability of the VA to coordinate diabetes research on a diverse array of patients at numerous sites around the country. The ADA has, for a number of years, maintained a close and successful working relationship with the VA; in fact, a number of ADA's volunteer leaders work at VA Medical Centers or are principal investigators in VA research grants. For example, the current ADA President, John Colwell, M.D., Ph.D. is the Associate Chief of staff for Research and Development at the VA Medical Center in Charleston, South Carolina. Immediate Past President Daniel Porte Jr., M.D., is Director of Research at the Seattle VA Medical Center, and President-Elect Charles Clark, M.D., is Coordinator of Health Services Research at the VA Medical Center in Indianapolis. Karl Sussman, M.D., a former President of the ADA, is currently Associate Chief of Staff for Research and Development at the Denver VA Medical Center. From these examples alone it is clear that the ADA has a strong commitment to the continued integrity of the VA Medical Research enterprise. Further, Roslyn Yalow, M.D., Chief of Nuclear Medicine at the Bronx VA Medical Center, received a Nobel Prize for her work in developing techniques in insulin immunoassay, which were a tremendous breakthrough in understanding the process by which cells secrete insulin. Additionally, Dr. Yalow has played a strong and effective leadership role in the ADA, and is a winner of an Association award for scientific achievement. Andrew Schally, M.D., an endocrinologist at the New Orleans VA Medical Center, received his Nobel

Prize for his work in discerning the role of neuropeptides in regulating the endocrine system.

The VA is at the forefront in attempting to translate the latest advances in medical research to improve care of patients with diabetes. Through VA medical research, our understanding of non-insulin-dependent diabetes mellitus (NIDDM) has increased dramatically. It now appears that NIDDM is caused by cellular resistance to the action of insulin, as well as the partial failure of cells in the pancreas to secrete sufficient quantities of insulin. Studies are now underway at the VA to determine the most appropriate method to prevent vascular complications of diabetes, including how to decrease serum lipid levels, and also in diminishing the prevalence of increased vascular clotting in people with diabetes. VA medical centers are currently exploring therapeutic programs involving dietary control and the use of insulin and oral hypoglycemia (low blood sugar) agents to achieve better control of diabetes and prevent its long-term complications.

Now, the integrity of VA Medical Research has been seriously weakened over the course of the last several years by repeated attempts by the Administration to slash VA medical research funding. While Congress has recognized the draconian results of following such a policy and has provided the VA with more research dollars than the President has recommended, there nevertheless remains a serious shortfall between amounts actually obligated and the critical research and health care needs of our nation's veterans.

We must stress that research conducted at VA medical centers benefits not only the veteran population but also contributes to the health and well-being of all Americans. VA research achievements have improved the lives of millions of Americans; these achievements include the antibiotic cure for tuberculosis, the first cardiac pacemaker, the first liver transplant, the development of innovative prosthetic devices, and the use of CAT scanners.

Research advances similar to those mentioned above cannot continue, however, if VA medical research initiatives are not adequately funded. To improve health care for America's veterans and to continue exploration of promising scientific windows of opportunity in VA research, the ADA makes the following recommendations for FY 1988 appropriations for VA medical research programs.

Medical and Prosthetic Research. The medical research Programs conducted by the VA augment and bolster the quality of health care provided to America's veterans. VA medical research has a well-founded reputation for uncompromising excellence in meeting the health care needs of veterans and the general population alike, particularly in the areas of new treatment approaches and delivery modalities.

Once again, however, the Administration has failed to recognize the value and importance of VA medical research programs, and proposed a budget for FY 1988 for this account of $198.8 million. If the one-time transfer of $20 million from the Department of Defense is discounted, the proposed level represents an increase of only $6 million over the FY 1987 level--far short of the actual need of VA medical research activities. Further, most of that increase would be absorbed by non-research activities -- pay raises, contributions to the federal retirement fund, and directed research projects.

We believe that the unique clinician/basic investigator relationship that lies at the core of the success of the VA medical research effort must be maintained and strengthened. We therefore recommend an appropriation of $226 million for FY 1988 for VA medical research; this figure excludes redirected or transferred funds or monies devoted to applied research. This level would allow the VA to fully fund all peer reviewed research grants in FY 1988 up to a priority score of 35, or approximately the same level as in FY 1985.

Medical Care. For FY 1988, the Administration proposed a budget of $9.967 billion, a level some $240 million short of the Congressional Budget Office (CBO) current services estimate of $10.21 billion. The President's budget submission also called for reductions in the number of health care professionals and employees through attrition and programmatic modifications. Since demand for VA medical care by aging veterans is on the rise, and since the incidence of diabetes rises markedly with age, the American Diabetes Association feels that this would be an especially imprudent time to reduce the number of health care personnel at the VA. The ADA therefore recommends that VA medical care programs be funded at a level of $10.388 billion in FY 1988, which would provide a current services level of effort plus a very small increase in funding for programs addressing the problems of aging veterans.

In conclusion, there is ample evidence that veterans, persons with diabetes, and the American public in general have received tremendous benefits from VA medical care and medical research programs. We applaud the Subcommittee for consistently recognizing this fact and urge its continued support for the important research and health care activities of the VA.

STATEMENT OF CHARLES M. CLARK, JR., M.D., CHAIRMAN, NATIONAL DIABETES ADVISORY BOARD

The National Diabetes Advisory Board was established by Congress to: (1) Review and evaluate the implementation of the long-range diabetes plan established by the National Commission on Diabetes in 1976 and (2) report annually to Congress on recommendations for future policies, programs, and budgetary requirements related to Federal diabetes research and health care activities. This year, the National Diabetes Advisory Board has updated the long-range plan to guide the next 10 years of Federal diabetes activities. The following recommendations relevant to the Veterans Administration have been extracted from The National Long-Range Plan to Combat Diabetes, 1987.

The Veterans Administration (VA) is unique among Federal agencies in that it is involved in the research, education, and patient care aspects of diabetes. The VA is the largest health care agency in the world, and survey data indicate that approximately 11 percent of VA hospital inpatients have diabetes as one of their medical problems. Because the VA has long-term responsibility for the care of its patients, preventive care for diabetes is an important aspect of the agency's health care goals.

The VA is also an important component of physician training programs; over two-thirds of all physicians in the United States have had at least part of their training at a VA medical center. The total trainee budget for the VA in fiscal year 1986 was $248 million, with an additional $8.5 million for the continuing education of VA medical center staff. The size of this program places the agency in a unique position to train physicians and other health care professionals in the latest techniques for the diagnosis and treatment of diabetes and its complications.

The National Diabetes Advisory Board (NDAB) believes that, over the next decade, the VA is in a singular position to develop diabetes research, training, and clinical programs that could serve as models for the Nation. To accomplish this, the VA will require additional resources and will need to establish internal procedures to coordinate an expanded diabetes initiative.

NDAB Funding Recommendations:

Despite the progress of the past decade, a significant disparity continues to exist between scientific advances and their application to the care provided to most diabetes patients. The NDAB recommends that the VA be allocated $2.5 million annually to:

- Develop special diabetes centers of excellence in patient care.
- Establish within each VA medical center a diabetes patient education program that meets the national standards for such programs, or develop cooperative arrangements with other medical centers so that every VA patient with diabetes will have access to such programs.
- Implement additional provider education efforts such as a national VA conference on advances in diabetes care.

Veterans Administration research investigators have long been in the forefront of research accomplishments, many of which are related to diabetes. The Research Program of the VA has suffered badly during the past few years, causing the loss of many investigators and research programs. The Advisory Board recommends that the VA:

- Receive funds sufficient to expand support of research to 4 percent of the total VA medical care budget, including 3 percent for biomedical research and 1 percent for prosthetic and health systems research.
- Receive sufficient funds to increase the number of research training awards to the 1980 level.

The Veterans Administration will require additional resources for clinical training to meet the needs of nurses, dietitians, physicians, and other health care personnel involved with diabetes patients. This training program should be coordinated by the VA's Office of Academic Affairs in conjunction with the affiliated universities. The NDAB recommends that the VA receive $1 million annually to address this clinical training need.

Other NDAB Recommendations

To facilitate the goals of the diabetes long-range plan, the NDAB recommends that the VA:

- Create a formal VA diabetes advisory group to provide oversight and recommendations to the agency's central office and medical director.
- Formulate a "white paper" on the status, problems, and recommendations related to diabetes within the Administration for submission to the VA central office and presentation to the NDAB. The paper should include an analysis of the impact of the VA's new resource allocation methodology on diabetes care.
- Prepare an annual report on morbidity and mortality of patients with diabetes and outcomes in the VA populations served.
- Participate with the Diabetes Translation Center, Center for Disease Control, in the development of diabetes standards of care. Develop VA "audit criteria" for use in monitoring diabetes care provided at individual VA facilities as part of the Systematic External Review Program surveys.
- Establish linkages between VA diabetes programs and VA hypertension screening and treatment programs.
- Implement the recommendations outlined by the National Heart, Lung and Blood Institute's Joint Committee on the Detection, Evaluation, and Treatment of High Blood Pressure for managing hypertension in persons with diabetes.
- Establish linkages between VA facilities and National Institutes of Health-sponsored Diabetes Research and Training Centers (DRTC's) and review DRTC reports for possible application by VA medical centers.
- Ensure that the VA diabetes care program is consistent with the guidelines in the NDAB document The Prevention and Treatment of Five Complications of Diabetes: A Guide for Primary Care Practitioners

and strengthen diabetes patient education by distributing the patient version of this document.

- Collaborate with the Diabetes Translation Center in the development of indicators of the quality, outcomes, and costs of diabetes care.
- Strengthen the role of Regional Medical Education Centers in professional diabetes education programs.

STATEMENT OF ANNABELLE WELCH, ALEXANDRIA, VA.

Senator Proxmire and Committee Members, I'm here today to testify about my personal experience in the Veterans Administration Hospital March and July 1975 when the budget was cut for that year. I stayed in the hospital two weeks each time with the late Mr. Welch because there were only two nurses on Ward 3E North at night for 30 patients. Mr. Welch was totally blind and that is the reason I had to stay. In 1982 I stayed one week with Mr. Welch 15 hours a day. In March 1983 I stayed one week for the same number of hours each day. If the Veterans Administration budget is cut for 1988, I don't know what will happen in our VA hospitals. Senator Proxmire, I hope your committee will not let this happen to anyone else.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

STATEMENT OF JOHN SIMON, PRESIDENT, NATIONAL HOUSING CONFERENCE

INTRODUCTION OF WITNESSES

Senator PROXMIRE. Our next witnesses I will ask to come to the table: John Simon, president of the National Housing Conference; Richard Mitchell, Penobscot Indian Nation; Bob Duea, Child Welfare League, Consortium for Citizens with Disabilities; Bernard Gould, Association for Retarded Citizens of the United States; and Gorham Black, legislative counsel for the American Association of Retired Persons.

It looks like we have a couple of absentees here. Is Dr. John Simon here?

[No response.]

Senator PROXMIRE. Mr. Richard Mitchell? Very good, sir. Bob Duea? Very good. Bernard Gould; Gorham Black.

Mr. Mitchell, go right ahead, sir.

Mr. MITCHELL. Thank you, Mr. Chairman. My name is Richard Mitchell. I am the executive director with the Tribal Reservation Housing Authority and I am also a member of the National American Indian Housing Board of Directors.

INDIAN HOUSING ISSUES

I want to thank you for allowing me for a few moments to speak on Indian housing issues. As we all know, one of the biggest problems facing us today in Indian country is the lack of safe and sanitary and decent housing. We are currently faced with cuts in Indian housing with the administration's proposal to provide 1,000 units and the H.R. 4 proposal to pride an annual maximum of 2,000. While these numbers are very noble, they just do not address the needs that we do have.

The very minimum number of units that we would require would be 3,000, and the maximum is 6,000 units. Families on Indian reservations around the country are presently faced with long waiting lists for housing, and these long lists have created nightmares in the form of extended family living conditions whereby multiple families remain forced to share the same living quarters while they wait for other housing to become available.

Still, other families are forced to live in substandard housing conditions. These conditions encourage and foster poor health conditions, create social disruptions, and even contribute to the devaluation and breakup of families.

Recent statistics taken from the Bureau of Labor of Indian Affairs Consolidated Housing Authority show that 92,500 Indian families are in need of some type of housing assistance. The assistance is needed in two forms: One, the renovation of substandard units, which involves 39,880 families; and two, new housing construction which involves the remaining 52,700 families.

For the sake of not seeming redundant, I would like to emphasize the great need we have in Indian country for housing, the rescission and budget cuts, not to mention current legislation forcing some Indian families who want to stay on the reservation off the reservation, off in search of housing only to have them wind up in substandard housing elsewhere. Their plight only serves to underscore the urgency of providing the much-needed housing stock.

While we are striving to provide suitable housing for Indian country, we must not lose sight of the current HUD housing stock and the regulations governing their occupancy. Some of the regulations require change, and one very obvious area is the Turnkey III Program's 30 percent of gross income to rent ratio.

In our attempts to provide housing for our people and restore pride and a sense of purpose to their lives, we must make certain that they can establish a meaningful existence for themselves and their families.

EMPLOYMENT OPPORTUNITIES

This can be accomplished by providing them with employment opportunities. However, housing authorities with the Turnkey III Program are faced with computing monthly rental payments from one-third of the family's gross annual income. The very fact that such a high portion of one's income is needed to make a rental payment discourages families from trying to make an honest effort at employment and trying to improve their lot in life.

On the other hand, we have Indian families that are being forced off reservations because of the high rents that are computed under this program. It is a fact that similar units off the reservation charge a lower amount for rent.

A solution to this problem must be established immediately. To that end, I will offer up three remedies: No. 1 will be to lower the required 30 percent of gross income to rent ratio to a more realistic 25 percent of net income to rent; and two, establish a ceiling rent; or three, create a simplified method to convert Turnkey III units to the Mutual Help Program, which utilizes a much lower percentage factor to determine rental payments.

Of the three options, the most desirable would be the conversion method, which would provide for a more uniform rental computation method that would be fair and reasonable for all families. At the present time, we are faced with the inability of the HUD field offices to effectively implement and perform the conversion process.

I myself, from from my own reservation, am losing good families in my housing development that are taking time to improve their units and make their payments without any problems because of the high rental payments. They are being forced off the reservation to find more suitable housing.

Some sort of a method has to be devised whereby we can receive some of this burden of the high rent, because they are unfair.

Senator PROXMIRE. Thank you very much, sir.

Mr. MITCHELL. Mr. Chairman, I would like to thank you on behalf of my governing council also for the programs we have received and, once again, thank you for the time.

Senator PROXMIRE. Thank you, and your statement will be printed in full in the record.

[The statement follows:]

STATEMENT OF RICHARD H. MITCHELL, EXECUTIVE DIRECTOR, PENOBSCOT TRIBAL RESERVATION HOUSING AUTHORITY

Mr. Chairman and members of the Senate Appropriations Subcommittee on HUD and Independent Agencies, my name is Richard H. Mitchell and I am the Executive Director of the Penobscot Tribal Reservation Housing Authority. I would like to thank-you for this opportunity to appear before you here today to testify on Indian Housing issues.

One of the biggest problems facing us today in Indian Country today is the lack of safe, sanitary and decent housing. We are currently faced with cuts in Indian housing with the Administration's proposal to provide 1,000 units and the H. R. 4 proposal to provide an annual maximum of 2,000 units. These numbers are totally inadequate, however, and the very minimum number of units that are needed are 3,000 with an annual need of 6,000 being the more realistic ideal.

Families on Indian reservations around the country are presently faced with long waiting lists for housing. These long lists have created nightmares in the form of extended family living conditions whereby multiple families are being forced to share the same living quarters while they wait for housing to become available. Still, other families are forced to live in substandard housing conditions. These conditions encourage and foster poor health conditions, create social disruptions and even upset the balance of and contribute to the break-up of families.

Recent statistics taken from the latest Bureau of Indian Affairs Consolidated Housing Inventory shows that 92,580 Indian families are in need of some type of housing assistance. This assistance is needed in two forms: (1) renovation of substandard units, which involves 39,880 families and; (2) new housing construction, which involves the remaining 52,700 families. For the sake of not seeming redundant, I would like to re-emphasize the great need we have in Indian Country for housing. The recessions and budget cuts, not to mention current legislation, are forcing some Indian families, who want to stay on reservation, off the reservations in search of housing only to have them wind up in substandard housing elsewhere. Their plight only serves to underscore the urgency of providing the much needed housing stock.

While we are striving to provide suitable housing for Indian Country we must not lose sight of the current HUD housing stock and the regulations governing their occupancy. Some areas of the regulations require change and one very obvious area is the Turnkey III Program's 30% of gross income to rent ratio. In our attempts to provide housing for our people and restore pride and a sense of purpose to their lives we must make certain that they can establish a meaningful existence for themselves and their families. This can be accomplished by providing them with employment opportunities. However, Housing Authorities with the Turnkey III Program are faced with computing monthly rental payments from 30% of the family's gross annual income. The very fact that such a high portion of one's income is needed to make a rental payment discourages families from trying to make an honest effort at employment and trying to improve their lot in life. On the other hand, we have Indian families that are being forced off the reservations because of the high rents that are computed under this program. It is a fact that similiar units off the reservation charge a lower amount for rent. A solution to this problem must be established immediately and to that end I will offer up the following remedies: (1) lower the required 30% of gross income to rent ratio to a more reasonable and realistic 25% of net income to rent, and; (2) establish a ceiling rent, or; (3) create a simplified method to convert Turnkey III units to the Mutual Help Program, which utilizes a much lower percentage factor to determine rental payments. Of the three options, the most desirable would be the conversion method, which would provide for a more uniform rental computation method that would be fair and reasonable for all families. At the present time we are faced with the inability of the HUD field offices to effectively implement and perform the conversion process.

Attempts to upgrade existing substandard housing conditions have not met with much success due to the inadequate amount of CIAP funds made available. Indian housing receives only 2% of the total funds provided for purposes of modernization. This amount is not an adequate amount and if we are to make any gains in the modernization of existing housing stock a more realistic amount equal to 4% of the total funds needs to be expended.

Indian housing needs have long been ignored and the time to address these needs is past due. I would point out, that while a wide variety of housing programs exist for most Americans the same cannot be said for the American Indian,who resides on trust land. Conventional mortgages, for example, are either non-existent or are provided at such high and unreasonable rates from the private sector, that Indian families are discouraged from trying to participate in them. Rental properties, on the other hand, are not available on reservations due to the shortage of housing stock. These factors combine with a unique social and economic structure to make housing resources very limited and narrow in availability to Indian families. The demand for housing is real and with the continued growth of young Indian families the need for housing assistance is that much greater.

The budget proposed by the Administration for the Indian Health Service indicates that no funds have been requested for sanitation facilities for Indian families in FY 88. It is readily acknowledged that unmet sanitation needs exist in Indian Country and to zero out funds with this thought in mind is a totally inappropriate act. There currently exists, in various parts of the country, housing units that do not have sanitation facilities and are in desparate need of these services. The lack of proper and adequate sanitation facilities does nothing but enhance the growth of disease and illness. Previous funds from the Indian Health Service have been provided to establish sanitation systems that are now suddenly facing the prospect of no more funds. In most cases these systems are not complete and leaving them high and dry without adequate funding for their completion will cause them to fall into disrepair and not serve the function for which they were originally intended. A restoration of funds must be provided to insure that Indian Country has adequate water supply and sewage and waste disposal systems and these funds must be, at the very minimum, at least equivalent to the FY 87 levels.

The CDBG program should be increased to a level where all Tribes can be eligible and participate. The unfortunate aspect of the present program is that it favors large tribes and severely restricts the participation of smaller tribes. A case in point is the Penobscot Tribe whereby we participated for years in the 'old' CDBG program we are now unable to compete with larger tribes in the 'new' CDBG program due to the ranking system assigned to the application process. On the other hand, we would rank as a 'priority' if we were able to compete with local non-Indian communities. We do have a need for CDBG funding and would very much like to participate in this program, however, the fund limitations make this impossible.

The UDAG program is a high priority program for Indian Tribes and should be funded. This funding level should at least approximate the FY 87 amounts. A great deal of success has been derived by Indian communities through utilization of the previous UDAG Grants and the program must receive high praise for the stimulating growth it has fostered within Indian Country. The Penobscot Nation itself can attest to this success as it is clearly evident in the cassette factory that is in operation now, in part, due to the funding from UDAG. This factory has stimulated employment in the community and it is fully anticipated that a total of 250 people will be employed in the next year and a half. If it were not for UDAG it is highly unlikely that this success would have been achieved. The continued economic growth of Indian communities is very much contingent upon the continued funding of UDAG.

In conclusion, I would like to urge and request your support of these measures. On behalf of the Penobscot Nation Governor and Council we thank-you for these programs. Thank-you for your indulgence.

STATEMENT OF ROBERT DUEA, PRESIDENT, LUTHERAN SOCIAL SERVICES OF WISCONSIN AND UPPER MICHIGAN, ON BEHALF OF THE CONSORTIUM FOR CITIZENS WITH DEVELOPMENTAL DISABILITIES AND THE CHILD WELFARE LEAGUE OF AMERICA

Senator PROXMIRE. Our next witness is Bob Duea, Child Welfare League, Consortium for Citizens with Developmental Disabilities.

Go ahead, sir.

Mr. DUEA. Good morning, Mr. Chairman. I bring greetings from Wisconsin. The weather there is nicer this morning than it is here.

Senator PROXMIRE. That is usually the case, you know. As a matter of fact, we had a much better winter in Wisconsin this year.

Mr. DUEA. My name is Robert Duea. I am president of the Lutheran Social Services of Wisconsin and Upper Michigan. Our agency has a 105-year history. We currently have 110 sites from which we serve 60,000 people. We have 8,900 employees and about the same number of volunteers.

These people have been dedicated to better lives for children and youth and adults. I am testifying, as you have already noted, on the invitation of the Child Welfare League of America and on behalf of the Consortium for Citizens with Developmental Disabilities, which represents more than 60 national organizations.

We can applaud the past efforts in housing development. I wish to confront the virtual decimation of programs and initiatives targeted toward housing our fellow citizens with special needs.

HANDICAPPED AND CHILDREN

I really want to focus my comments this morning upon two groups of citizens with which my agency has special expertise and interest; namely, the handicapped and the children.

First the handicapped. There are 7.9 million persons with severe disabilities that need special housing consideration in our country right now. There are long waiting lists in the 15,000 community facilities that presently exist. An example is our agency started with virtually no program 2 to 3 years ago, and we are now spending $2 million a year.

An excellent example of how we put the private and public sector together is we built what is now called Kensington East in Appleton. It is a residential program for class C developmentally disabled people. Severe disabilities sprinkle the people that are there. There are eight men there now in a facility that is put together by businessmen. They put two Wausau homes together and built that facility for us.

We can provide all kinds of respite voluntary care. We can provide all kinds of support systems. We cannot build the facilities for these developmentally disabled people. I think the part that really bothered us a lot is as we had felt very good about placing these eight young men that had had an institutional life of 15 years on average, the county and state people met with our guard immediately afterward and said, "There are 1,200 more just like them."

In the past decade, this nation has submitted itself to an agenda of deinstitutionalization. Yet there are still 300,000 people institutionalized unnecessarily, primarily because there is no housing if they were returned to their community.

Despite this need, because of the administration, for the last 6 years we have lost $31 billion in that kind of assistance. The President is proposing that 2,000 section 202 units be forwarded to 1988. They are proposing the termination of section 8 in congregate housing.

Let me turn to children, because that is where our agency has its major background. Children are the most rapidly increasing poor. Thirty-six percent of all homeless people are families with children. The Low Income Housing Information Service estimated in 1985 that there are 8 million renting households in need of subsidized housing. Their incomes are below $7,300, but only 4.2 million of those units are available.

In 1981, there was a 1.8 million gap. In other words, there is a 4 million unit gap now, and it was 1.8 six years ago. Our report card, I think, has gone from a C to an F.

What are some of the specifics affecting those children? They are being cut by 60 percent. Their rents are increasing and so on.

I would like to just summarize with a couple of stories, because they are not statistics. They are people. You probably read from some of the state papers, Mr. Chairman, about the Wausau family living in a stable. Three of the children were killed in a fire while the rest of the family was badly hurt. We have a 14-year old girl we want to return to the family after one of our treatment programs, but they live in a pickup camper.

We have a Kenosha man who lost his job and is now living in a hunting shack near Sparta. We get their kid because he was acting out.

When we see people coming in that are battering their kids, we are estimating that about 50 percent of them have housing implications. It is a very serious issue. We would challenge our leadership to try to react to that.

AMERICAN VALUES

The words "home" and "America" are integral to our identity. As servants to our citizens, I think you can be proud of upholding such values as home, as I try to hold up that value. To be hopeless or denied housing in America runs counter to our identity as a people and the value system we espouse as a society.

Your deliberations on the 1988 appropriations bill should reflect our priorities and include the specific recommendations that we have attached to the testimony. Thank you.

[The statement follows:]

STATEMENT OF ROBERT DUEA, PRESIDENT, LUTHERAN SOCIAL SERVICES OF WISCONSIN AND UPPER MICHIGAN

Good morning Mr. Chairman, I bring you greetings from your constituents in our home state of Wisconsin.

My name is Robert Duea and I am President of Lutheran Social Services of Wisconsin and Upper Michigan. My agency has a long and proud history of service to the people of Wisconsin. Founded in 1882 we currently have 110 sites serving 60,000 people. Our services are provided by more than 900 employees dedicated to a better life for children, youth and families.

I testify before you today at the invitation of the Child Welfare League of America and on behalf of the Consortium for Citizens with Developmental Disabilities. CCDD represents more than 60 national organizations concerned with the health, social service, education and mental health of people with disabilities.

It would be a welcome opportunity to come before you today and applaud the efforts of all our groups and the initiatives of the federal, state and local government in the area of housing for people in need. Unfortunately, my purpose today is not to applaud but rather decry the virtual decimation of programs and initiatives targeted toward housing our fellow U.S. citizens with special need. I will focus today on the needs of two particular groups of citizens: 1) those with handicaps and, 2) children.

Persons with Handicaps

Approximately 7.9 million persons in the United States are considered to have a severe disability. These are people who are unable to independently conduct some major activity of daily living. Many, if not most, of these individuals require some special accommodations for housing. There are long waiting lists for most of the 15,000 community residential facilities for persons with developmental disabilities across the nation. Last year, for example, when LSS opened a facility for 8 developmentally disabled people the state and county authorities asked us to open additional facilities in order to receive some of the more than 1200 people waiting for a home. From virtually no activity in this field two years ago, LSS has emerged as one of the only agencies providing $2 million in housing, day care, special therapies and support programs that now allow hundreds of people with disabilities to live as independent and normal a life as possible in the community.

We could not have begun this work were it not for the availability of federal dollars to supplement our private dollars in funding these new initiatives.

It was over 10 years ago when governmental agencies, service providers and advocates alike, called for the deinstitutionalization of our citizens with disabilities. A worthy goal that has been translated into short sighted funding streams and dead end bureaucratic nightmares for those people who are now in the community and desperately seek basic services --most noticeably housing services.

Securing appropriate housing is a major prerequisite to social integration and living independently in the community, yet after more than 25 years of attempts to develop specialized housing, people with handicaps continue to be among the most inadequately and inappropriately housed segments of American society.

Available data suggest that the cost of providing appropriate housing options for people with disabilities are well worth the investment. Putting investment aside, or rather combining it with compelling humanitarian reasons such as quality of life, independence, self-esteem, productivity (which means a tax payer) -- we are hard pressed to see why the federal government has been so very slow in providing needed leadership and adequate levels of funding.

The lack of available and affordable housing for people with handicaps frequently results in the unnecessary and expensive institutionalization of such persons. There are estimates that over 300,000 persons with handicapping conditions are unnecessarily institutionalized due to a lack of appropriate housing arrangements.

Despite this obvious need for low-income and specialized housing, subsidized housing has been the target of this Administration's budget ax for six years. If the President's FY 1988 Budget request for housing aid were to be adopted, low-income and disabled people would be victims of a $31 billion shortfall in Federal dollars over the past six years.

The President also proposes to shift 2,000 of the 1987 Section 202 housing units to 1988 and termination of the program despite the unmet demand and increased need for housing. Similarly, the Administration proposes termination of the Section 8 housing assistance program, and the Congregate Housing Services program.

The President's budget thus results in a wholesale attack on critical housing programs for poor people and people with a disability. Without question these short-sighted and inhumane policies have contributed to and will continue to contribute to the homeless crisis in America. It's really rather simple -- no house translates into homelessness.

Children and Their Families

Perhaps at no other time in our history as a nation have we had to face the bleek fact that children are our poorest segment of the population and that 36% of all homeless people are families with children -- the largest group of people living on the street.

It is no coincidence Mr. Chairman that children are poorer and homeless at the same time low-income housing has been slashed and gutted with amazing calouseness and disregard.

It is ironic that while, as a nation, we champion the virtues of family but simultaneously turn our backs to the fact these same families are suffering an unprecedented assault by the federal government abdicating responsibility to assist them.

The Low Income Housing Information Service, a non-profit research organization, estimated that in 1985, there were over 8 million renter households with incomes below $7,366 (50 percent of renter media income), but only 4.2 million units of rental housing available with rents they could afford at 30 percent of income. This resulted in a "housing gap" of almost 4 million units. In 1981 this same gap was estimated at 1.8 million. In other words, there are twice as many families looking for housing today as their are available and affordable units.

Since 1981, appropriated budget authority for low-income housing assistance has been cut by over 60%. Tenant rents have increased by 25 percent. Subsidies for the construction and rehabilitation of housing for low-income people as all but ceased. The Section 8 New Construction and Substantial Rehabilitation programs were repealed in 1983. Only the Section 202 program for housing for elderly and handicapped remains to provide federal development assistance to low and very low income people.

The housing problem experienced by children and their families reflects a three-fold problem: (1) much of the low-income housing has been torn down and/or converted into high-income housing; (2) the number of poor people has increased; (3) builders are not finding it profitable to build or rent housing for low-income families and therefore discriminate in overt and subtle ways.

Although efforts at a federal level have been successful in assisting millions of families in obtaining decent, safe, sanitary housing. Unfortunately many more are in need of assistance and can not receive it. For every family receiving aid, there are four unable to partake in such benefits.

Statistics speak for the bigger picture but the following examples of real people, citizens of the United States and residents of your state, Mr. Chairman, vividly depict the current crises.

In Wausau, Wisconsin, a family of 7 were living in an uninsulated, cold water flat this winter awaiting placement in a family unit in a low-income housing development. One night fire struck killing two of the children and severely burning both parents and the surviving three children.

Currently in our Madison residential facility we have a young lady of 14 who has made tremendous progress and is able to return to her family. Unfortunately the family is currently living in the back of a pickup truck due to the lack of available and affordable rental units. She must stay at a residential facility at a cost of $100 per day because the famiy cannot find a home.

Finally in Kanosha an unemployed autoworker recently lost his home and moved his family to an insulated hunting shack in the northern part of the state. One child has already been removed from the family due to abuse. Mr. Chairman, in 50% of the cases of abuse within a family, housing is indicated as a major problem for the family and significant contributor to extreme stress.

CCDD and other organizations concerned with housing low-income children and families encourage this committee, Mr. Chairman to match rhetoric with real assistance. There must be more Section 8 certificates, increased monies for restoration and construction of low-income housing and greater attention to new initiatives that move people out of poverty and into productive lives.

Before concluding, Mr. Chairman, I would like to point out two major bills currently before the Congress that have a significant impact on the issues of available and affordable housing for children and people with handicaps.

The Urgent Relief for Homeless Act (H.R. 558) now pending a Senate-House conference contains within it authoritzation for $225 million for housing assistance provisions. These provisions include shelters, transitional housing programs and permanent housing initiatives, specifically designated for handicapped people. It was distressing to see that this subcommittee and the full Appropriations Committee did not appropriate the $225 million authorized. While we are all aware of the need for fiscal responsibility and the need to reduce the deficit it is likewise crucial to provide relief to this population of

Americans. Priorities, Mr. Chairman, are difficult to decide on but there appears to be no denying that the $225 million for housing homeless people is an urgently needed priority that warrants your attention and steadfast support.

The Fair Housing Amendments of 1987 (S. 558) currently being considered by your colleagues in the Judiciary Committee contains two very important provisions expanding protection provisions to both children and families and people with handicaps. The bill in its current form appropriately defines people with handicaps and properly exempts bonafide retirement communities from the "familiar status" clause. We urge your support for the maintenance and passage of this important bill.

Thank you Mr. Chairman and members of the Committee. I appreciate the opportunity to testify before you today.

The word "home" in America is as integral to our identity as a society as the words "mom", "apple pie" and "hot dog". Dorothy wanted to return home so badly that she used the only wish on her ruby slippers to get back. E.T. pointed longingly toward the heavens and indicated his desire to go home. To be homeless or denied housing in America runs counter to our identity as a people and the value system we espouse as a society. Your deliberations on the 1988 Appropriations Bill should reflect our priorities and include the specific recommendations attached.

Thank you.

SUMMARY OF CCDD RECOMMENDATIONS

The CCDD Task Force on Housing respectfully submits the following recommendations to the Subcommittee on HUD-Independent Agencies of the Senate Committee on Appropriations:

- An appropriation which will provide 12,000 new units under the HUD Section 202 Direct Loan Program for FY 1988.
- Opposition to the termination of the Section 8 certificate program and an appropriation for level funding in FY 1988.
- An appropriation of $3.5 million for Congregate Housing Services in FY 1988.
- An appropriation of $3350.0 million for the Community Development Block Grant in FY 1988.
- An appropriation of $100 million for the new Permanent Housing Program for Homeless Handicapped People in FY 1988.
- An appropriation for the full amount authorized ($225 million) by the House-Senate Conference Committee on the Urgent Relief for the Homeless Act (HR 558) in FY 1988.

Senator PROXMIRE. Thank you, sir.

I have a question for you, but before I get to that, I am going to call on our last witness in this panel, Mr. Black.

Gorham Black is legislative counsel for the American Association of Retired Persons.

Mr. Black, go ahead.

STATEMENT OF GORHAM BLACK, LEGISLATIVE COUNSEL, AMERICAN ASSOCIATION OF RETIRED PERSONS

Mr. BLACK. Thank you, Mr. Chairman and members of the subcommittee.

On behalf of the American Association of Retired Persons [AARP], we thank you for this opportunity to testify on appropriations for programs under this subcommittee's jurisdiction.

In addition to my being on the AARP National Legislative Council, I am formerly secretary of aging for the Commonwealth of Pennsylvania. Housing is certainly a problem not only in Pennsylvania, but nationwide. My complete statement is appended to the record, I believe.

Senator PROXMIRE. It will be printed in full in the record.

Mr. BLACK. I will just briefly summarize some of our important recommendations.

CONGREGATE HOUSING SERVICES PROGRAM

We believe that increased funding for the Congregate Housing Services Program [CHSP] to $13 million will ensure CHSP for 1 year in the existing 61 sites and will allow expansion to some 25 additional sites.

One of the great challenges facing public and assisted housing management is providing for the special needs of older tenants who are "aging in place." We estimate that of the 750,000 elderly persons living in public and section 202 housing, some 113,000 are in immediate need of support services. These older persons have few, if any, alternatives to their current residences.

CHSP has proven to be very effective in preventing premature or unnecessary institutionalization of frail, older residents in section 202 and public housing through the provision of meals, housekeeping and other support services.

Not only have such residents been spared from unnecessary and costly placement in a nursing home, but persons inappropriately institutionalized have been able to transfer out because CHSP services were available.

We further recommend the continuation of the section 202 housing for the elderly and handicapped programs at levels sufficient to produce 12,000 new units.

PUBLIC HOUSING NEED

We recommend, also, that we should maintain full operating and modernization subsidies in public housing. There are over 500,000 units of public housing occupied by older households. Some 40 percent of all households are living in public housing. It is critical that public housing authorities be given adequate funds to maintain and upgrade public housing units to protect these valuable older persons and to preserve the valuable resource represented by existing low-income housing.

We also recommend the maintaining of the section 8 existing program as the primary form of rental assistance. Some 491,000 section 8 certificates are now used by elderly households.

In another area, AARP urges the subcommittee to approve report language to encourage Environmental Protection Agency units to make greater use of senior environmental employment program enrollees and improving our environment.

In conclusion, AARP urges the subcommittee to continue its strong support for assisted housing programs, reject proposed rescissions and deferrals of fiscal year 1987 appropriations for assisted and public housing programs and approve fiscal year 1988 appropriations for housing assistance at no less than levels appropriated for fiscal year 1987.

In addition, we urge the subcommittee to incorporate report language encouraging EPA to make greater use of SEE enrollees.

Thank you, Mr. Chairman. I will be happy to answer any questions.

Senator PROXMIRE. Thank you, Mr. Black.

[The statement follows:]

STATEMENT OF GORHAM BLACK, NATIONAL LEGISLATIVE COUNCIL, AMERICAN ASSOCIATION OF RETIRED PERSONS

Mr. Chairman, I am Gorham Black, formerly Secretary of Aging for the Commonwealth of Pennsylvania and presently a member of AARP's National Legislative Council. On behalf of AARP, a membership organization of 25 million older persons, thank you for this opportunity to testify on appropriations for programs under this Subcommittee's jurisdiction.

With regard to housing programs, AARP urges you to reject proposed rescissions and deferrals of FY 1987 appropriations for assisted and public housing programs, and to approve FY 1988 appropriations for housing assistance at no less than levels appropriated for FY 1987. Our recommendations for specific programs can be summarized as follows:

1) Increase funding for the Congregate Housing Services Program to $13 million for FY 1988; extend the current 61 CHSP sites for an additional year, and establish 25 new project sites.

2) Provide sufficient funding for Section 202 Housing for the Elderly and Handicapped to support 12,000 new units.

3) Maintain full operating and modernization subsidies for public housing, and continue production in areas with rental housing shortages.

4) Retain the Section 8 Existing program as the primary source of rental assistance for low-income Americans.

With regard to the Senior Environmental Employment (SEE) program, AARP urges that report language be approved to encourage greater use of SEE volunteers by Environmental Protection Agency (EPA) units.

In a recent survey of AARP members and volunteer leaders, the lack of affordable housing was cited as one of two most serious national issues affecting older persons. We regret that the Administration has chosen to submit a housing budget for FY 1988 that is only slightly different from previous budgets rejected repeatedly by the Congress. A new approach is needed, one that recognizes and renews the federal commitment to decent, affordable housing for all Americans.

While great progress has been made in improving the housing conditions of older persons, too many cannot find or afford suitable housing. Waiting lists for federally assisted senior housing projects are very long: nearly one in four applicants must wait 5 or more years. The need for this type of housing will continue to grow as the older population increases. Many older renters, particulary single older women, have a difficult time making ends meet. The median rent of an elderly woman living alone consumes nearly half of her income. The Administration's proposals would place even greater burdens on the most vulnerable people.

AARP believes the FY 1988 HUD Appropriations bill can assist in initiating a more adequate federal housing policy by making prudent investments in programs that meet current and future housing needs. I would like to highlight several of AARP's recommendations for the Subcommittee's consideration.

1) Increase funding for the Congregate Housing Services Program to $13 million -- One of the great challenges facing public and assisted housing management is

providing for the special needs of older tenants who are "aging in place." AARP estimates that of the 750,000 elderly persons living in public and Section 202 housing, some 113,000 are in immediate need of support services. These older persons have few, if any, alternatives to their current residences.

The Congregate Housing Services Program has proven very effective in preventing premature or unnecessary institutionalization of older residents in public and Section 202 housing through the provision of nutrition, housekeeping, personal care and other support services. Results released earlier this year from an evaluation conducted for HUD show that for every CHSP participant who required institutional care, 1.8 people in a non-CHSP control group had to be institutionalized. Further, the CHSP program demonstrated a significant deinstitutionalization effect, allowing nursing home residents to move to a less restrictive environment. The proportion of persons moving from nursing homes to CHSP sites was five times higher than that of those moving to non-CHSP sites.

The potential cost savings for the federal government are significant when older people are able to avoid institutionalization through provision of support services under the CHSP. The HUD evaluation indicated an average daily cost of $6.80 for CHSP versus $36 for intermediate care. Thus, CHSP could serve approximately 5 times more people with the same dollars spent for intermediate care.

Acknowledging the value and cost effectiveness of this program, the House Budget Resolution specifically allows $10 million in budget authority for CHSP in FY 88. S. 825, the Senate housing authorization bill, would increase CHSP's authorization to $20 million over two years and H.R. 4, the House housing authorization bill, would provide $13 million for CHSP in FY 1988. Funding at this level would permit continuation of the current 61 CHSP sites and allow 25 new project sites to be established. AARP believes the case is compelling for expansion of CHSP and we urge the Subcommittee to appropriate at least $13 million for the program.

2) Fund the Section 202 Housing for the Elderly and Handicapped Program at levels sufficient to produce 12,000 new units -- AARP urges the Subcommittee to reject the Administration's proposal to reduce funds already appropriated for FY 1987 and to terminate the Section 202 program in FY 1988. This program has already sustained a 40 percent funding reduction since 1979 and production levels are well below the 20,000 units per year target set by the 1981 White House Conference on Aging.

There is a high and growing need for the specially designed housing units successfully produced under the Section 202 program. Low income older and disabled persons are hard put to find--or even seek--unsubsidized accessible units that offer (among other features) lowered counter tops, non-slip floors, grab bars, extra wide doorways, and the nutrition and transportation services that allow them to maintain the fullest measure of independence and security. Waiting lists for existing Section 202 facilities are frequently closed. Moreover, older persons in Sections 8, 236, and 221(d)(3) facilities that are now reaching loan term are at risk of displacement, yet few affordable and appropriate settings await them in their communities. A rapidly aging American population ensures that the need for Section 202 units and similar alternatives will continue to increase. Beyond the advantages to residents of a less restrictive environment, congregate housing clearly avoids the heavy costs to taxpayers imposed by inappropriate institutionalization.

3) Maintain full operating and modernization subsidies in public housing -- There are over 500,000 units of public housing occupied by older households--some 40 percent of all households living in public housing. A recent study of the 100 largest public housing authorities, representing roughly half of all elderly headed households in public housing, found three-fourths of the elderly residents lived alone, more than one-third are 75 or older, and more than 80 percent have incomes below 50 percent of the area median. The Administration's continuing attempts to hinder the ability of public housing authorities to maintain and upgrade public housing units jeopardize the living conditions of these most vulnerable older persons. AARP believes that the current public housing stock is a valuable public resource and strong efforts should be made to arrest deterioration and provide a safer and less crime-prone environment for tenants. Also, production should be continued in areas where low income housing shortages exist.

4) Maintain the Section 8 Existing Program as the primary form of rental assistance--Some 491,000 Section 8 certificates are now used by elderly households. AARP opposes the Administration's proposals to replace the Section 8 existing program with housing vouchers. Such a change would be more costly for low income older tenants, since voucher payments may be adjusted only twice during a five year contract period, and any rent increases must be absorbed by tenants. By contrast, Section 8 rent subsidies are updated annually. The notion of the voucher providing a "shopper's incentive" is of dubious validity in a tight housing market; it is absurdly inappropriate when applied to special populations like the elderly and disabled. Many persons with mobility limitations can hardly compete with more able-bodied persons in finding affordable and suitable units.

Information obtained from the New York City Housing Authority on operation of the voucher demonstration there reinforces our concerns. While a slightly higher number of rentals were obtained under the voucher program, 39 percent of voucher families were paying more than 30 percent of their income for rent. In addition, in those cases where data was available, 83 percent of the families which participated in the voucher project paid a higher percentage of their income for rent than when they entered the program. There also appears to be an incentive for landlords to charge whatever the market will bear since the Public Housing Authority does not certify the reasonableness of rents under the program. In one case, a 74 year old renter, occupying the same apartment since 1971, rented "in place" under the demonstration program. The landlord asked for an increase from the existing rent of $190 to over $400. Advised by the Public Housing Authority that the voucher program would pay only up to $217, the landlord accepted a lower level of rent.

AARP recommends that the Subcommittee refrain from funding any additional vouchers until a through evaluation of the voucher demonstration is completed. We believe that the Section 8 existing program should remain the primary form of rental assistance for low-income persons.

With respect to the Senior Environmental Employment Program, AARP urges the Subcommittee to approve report language to encourage the Environmental Protection Agency (EPA) component units to make greater use of Senior Environmental Employment enrollees in improving our environment. Both the House and Senate HUD-Independent Agencies Appropriations Subcommittees approved this language for the Fiscal Year 1987 funding bill.

SEE not only provides crucial services to improve the environment in localities throughout the country, but it also enables older Americans to help themselves while helping others in their communities. The report language could help to expand roles for SEE enrollees in EPA component units, including complying with recent regulations for ground water, water supply monitoring, acid rain inventories, hazardous materials routing survey, water quality sampling and monitoring, and pesticide inventory and control. Additionally, the language could promote the establishment of state environmental assistance projects. Moreover, report language would make it possible for EPA to assist state and federal facilities in meeting the National Environmental Policy Act mandates.

SEE has proved to be a very successful program deserving of greater use by EPA.

Conclusion

AARP recognizes that high, sustained deficits place tremendous pressure on Congress. That is why the Association supports development of a fair and sound federal budget. The increases we have recommended in the Congregate Housing Services Program would be offset by savings in long term care costs. Further, we are only calling for maintenance of current spending levels in housing assistance. This is more than equitable, given the tremendous cuts housing programs have sustained. To reduce these programs further would jeopardize the living conditions of our poorest and most vulnerable citizens and exacerbate a growing housing crisis in many areas of the nation. AARP urges the Subcommittee to continue its strong tradition of support for assisted housing programs, and incorporate report language encouraging EPA to make greater use of SEE enrollees.

STATEMENT OF BERNARD GOULD, GOVERNMENTAL AFFAIRS COMMITTEE, ASSOCIATION FOR RETARDED CITIZENS OF THE UNITED STATES

Senator PROXMIRE. I understand that Mr. Gould has come, Bernard Gould from the Association for Retarded Citizens of the United States.

Mr. Gould, go right ahead, sir. You have 4 minutes. There is no discrimination here. We are going to give you 4 minutes like everybody else.

Mr. GOULD. My name is Bernard A. Gould. I am a member of the Governmental Affairs Committee of the Association for Retarded Citizens of the United States [ARC]. I am also the chairman of the congressional unit of the Governmental Affairs Committee of the state of Maryland affiliate of the ARC. I have submitted a written statement, Mr. Chairman. I am not reading that. I just am covering some highlights, if that is all right.

FULL SPECTRUM OF SERVICES FOR MENTALLY RETARDED

Our priority concern for a number of years has been to establish a full spectrum of services in the community for people who are mentally retarded, all types of services, occupational, physical, physical therapy, health services, family support services, educational services, and so on.

But at the top of those concerns, at least for the last few years, has been the establishment of community family-sized residential facilities in concert with phasing down of placements in very large, often more expensive and frequently somewhat inhumane institutional settings.

Now, the HUD programs have been relied on by our association to a very great extent to help develop the type of community residential services. The ARC affiliates around the country are now one of the major sponsors under the section 202 loan program for handicapped projects. We know that the private market is not about to supply sufficient housing for our members and the needs of other people with disabilities. I think HUD also realizes that that is the case.

SECTION 202 DIRECT LOANS

Section 202, of course, as you know, provides direct loans to nonprofit organizations to construct or rehabilitate and manage housing for low-income people who are elderly or who have disabilities.

The program is important to us, because it is the only capital financing mechanism within HUD specifically designed for housing development for people with disabilities. Approximately 20 percent of the units funded under section 202 for fiscal year 1986, for example, went to sponsors of housing people with disabilities.

As I mentioned, we are one of the principal sponsors of that type of housing as an association.

The administration has proposed what would, in effect, amount to a termination of the section 202 program in fiscal year 1988. The $131 million that appears in the administration's budget would authorize loans only for approved amendments to projects already in the pipeline. Any further developments would not be funded under the administration's budget.

There are long waiting lists for most of the existing 15,000, approximately, community residential facilities for persons that have some type of developmental disability across the nation. A substantial number of people with disabilities are living in substandard boarding houses; many of them are homeless. Over the last 10 years, the reduction in funding for new loan authority has resulted in a 60-percent reduction of the number of new units that are funded annually.

So we recommend that for fiscal year 1988 sufficient funding be allowed to permit the construction of approximately 12,000 units, which is the same number for which Congress appropriated funds for fiscal 1987.

Senator PROXMIRE. Could you summarize that, sir? Your time is up. But you can summarize that, quickly.

Mr. GOULD. The written statement is in the record, and if there are any questions, I would be glad to respond to them.

Senator PROXMIRE. Very good.

[The statement follows:]

STATEMENT OF BERNARD GOULD, MEMBER, GOVERNMENTAL AFFAIRS COMMITTEE, ASSOCIATION FOR RETARDED CITIZENS OF THE UNITED STATES

The Association for Retarded Citizens of the United States counts among its membership over 160,000 individuals across the nation who are, or speak on behalf of , the over six million United States citizens with mental retardation. Our priority concern, particularly in the last ten years, has been the establishment of community-based services for people with mental retardation and the concommitant deinstitutionalization of the large, frequently inhumane residential settings many have been forced to call home. Our efforts have, and continue to be, greatly dependent on the availability of affordable, accessible community-based housing or on access to the means to develop such housing.

As a result , the people we represent, and those who provide for them, look to programs available through HUD to spur the development of, and assure access to, community living options. In particular, the ARC, through its many affiliates, has become one of the largest sponsors of handicapped projects under the Section 202 loan program since its availability was expanded to programs for people with disabilities. We have found, as a 1984 report within HUD also concluded, that the private market, in and of itself, is not going to produce anywhere near sufficient housing to meet the needs of people with disabilities. Housing availability continues to be as major a problem as affordability for people with disabilities; thus, the continuance of assisted housing programs which both provide rental subsidies and prompt new construction and rehabilitation is of dual concern to our constituents.

Although the Section 202 program is the federal program which has most visibly contributed to expanding housing options for people with disabilities, there are many other ways in which HUD initiatives are assisting people with handicaps living in the community. For example, the Community Development Block Grant program has been helping organizations rehabilitate rental housing to meet the accessibility needs of tenants with disabilities. The Section 232 Mortgage Insurance Program promises to be increasingly instrumental in helping to leverage private financing for specialized housing. In the arena of direct subsidies, people with mental retardation and other disabilities have been entering a housing market less restrictive than the traditional group home alternatives by participating in the Section 8 Rent Assistance Program and by utilizing public housing.

The Congregate Services Program, slated once again for termination in the President's budget, has been a unique initiative to assure that those living in HUD facilities in the community will have the support necessary to keep them out of institutional settings. We applaud the intent expressed in S.825 to expand this program and hope that this Committee will assure full funding at the authorized level.

Access to community-based housing alternatives, besides offering the person with disabilities the opportunity for more normalized and integrated living situations, frequently also results in a lessening of the federal support dollars required for institution-based care. It is therefore with great concern that we have observed the continuing drastic decline in federal appropriations for assisted housing, by most estimates, over 60% during the last six years. We decry this trend, and we submit that lack of effective leadership within HUD as well as the Administration's abandonment of many of the committments which are embodied in the statutes authorizing our federal housing programs have been responsible for greatly exacerbating the nation's housing crisis and escalating the problem of homelessness, including among people with disabilities. Certainly it is not the need for appropriate and accessible housing which has diminished.

Our organization recognizes the current budget restrictions imposed by the serious and ongoing deficit problems. However, the increasing problems of homelessness and the need to provide affordable housing to our most at risk citizens, demands continued and viable federal support. Therefore, the Association for Retarded Citizens recommends current service level funding in the assisted housing programs, and in the Community Development Block Grant. For Section 202, this would mean assurance of the availability of 12,000 new units for FY 1988. In addition, we seek level funding for the Farmers Home Administration's Section 515 and Community Facilities programs which have both provided important impetus to the development of community-based services, including residential alternatives, to people with disabilities in rural areas.

As people with disabilities have emerged in growing numbers among the homeless population, the ARC has becoming increasingly concerned that housing and service programs be developed with their special needs in mind. Therefore, we have actively supported the inclusion in the Urgent Relief for the Homeless Act of a provision for Permanent Housing for Disabled Homeless. The provision structures a state grant matching program for permanent housing development for people with disabilities who are homeless or at risk of becoming homeless. Should the provision be finally authorized, we recommend FY 1988 funding at $100 million.

Last year Congress recognized the great need to prompt private financing mechanisms for housing for people with disabilities by setting aside $300,000 for sorely needed research and technical assistance activities. HUD has yet to issue a Request for Proposals to implement the recommendation. Your review of the status of the RFP would be greatly appreciated. We also recommend for your review the current implementation of cost containment guidelines within the Section 202 program. Through the experience of our many affiliates, we have come to believe that these guidelines are being arbitrarily applied, resulting in significant delays in project completion, escalating costs over periods of time, and, in some cases, sponsor withdrawal from the program.

Finally, an important answer to expanding the housing options for people with disabilities is to assure adequate protection from discrimination in attempting to access housing. The ARC is actively supporting the extension of protections against discrimination in housing for people with disabilities as embodied in the Fair Housing Amendments Act, S.558/H.R.1158. We encourage you to lend your support to this important legislation and to assure adequate funding for enforcement mechanisms as structured in the act and as set forth under the Fair Housing Initiatives Program in S.825.

Senator PROXMIRE. I wonder if John Simon has come. John Simon was scheduled to appear at 11:55.

Mr. COHEN. Mr. Chairman, I am his counsel, Carl Cohen, and he is somewhere between here and New York and has been for the last 2½ or 3 hours. We hope that you can maybe fit him in a little later, if possible.

Senator PROXMIRE. Fine. We will put him in at the end. I appreciate that, Carl, very much.

I do have a question for Mr. Duea.

GENERAL QUESTIONING

Mr. Duea, you are recommending an increase of $350 million for the community development block grant program [CDBG]. The budget resolution we just passed assumes a freeze at the current level of $3 billion.

What other programs under the subcommittee's jurisdiction should we reduce to find the extra $350 million you recommend for the CDBG program? We are in that kind of a jam. We just can't go above it. Theoretically, we could increase taxes, but our committee doesn't have any jurisdiction in that area. We have the space program, environmental protection program, veterans program to fund in this subcommittee.

What do you recommend we reduce in order to get this community development block grant?

Mr. DUEA. I don't have the answer to that, Senator. I know that is a predicament that you are faced with.

Senator PROXMIRE. If you think it over for the record, if you want to submit that in writing?

Mr. DUEA. I certainly will. That is what I was going to suggest.

Senator PROXMIRE. Any solution you have, you make a very good appeal. We are very sympathetic to you, as we are with the other witnesses here, but we have a problem because you are asking for increased funding.

Mr. DUEA. You asked a very specific question on a very complicated matter, obviously. I will be more than happy on behalf of the Child Welfare League and the Consortium to put an answer together for that and give you our feedback.

Senator PROXMIRE. Thank you very much. Thank you, gentlemen.

MELVIN J. ADAMS, PRESIDENT, NATIONAL ASSOCIATION OF HOUSING AND REDEVELOPMENT OFFICIALS

Senator PROXMIRE. Our next witnesses are Janet Charlton, the National Leased Housing Association; Melvin Adams, president of the National Association of Housing and Redevelopment Officials; William Ryan Drew, an old friend of ours, counsel of the Large Public Housing Authorities; Richard Mapp, vice president of the National Caucus and Center on Black Aged; and James Abbott, president and chief executive officer of the First Union Mortgage Corp. and Mortgage Bankers Association.

Mr. ADAMS. I am Melvin Adams, president of the National Association of Housing and Redevelopment Officials.

Senator PROXMIRE. Very good, sir.

Mr. ADAMS. I would like to have my statement included in the record.

Senator PROXMIRE. It will be printed and included in full.

Mr. ADAMS. I would like to make a few brief remarks on the community development block grant programs and talk more about the importance of the programs rather than specific dollars.

Senator PROXMIRE. Thank you.

COMMUNITY DEVELOPMENT BLOCK GRANTS

Mr. ADAMS. CDBG is the only program left that really helps to improve neighborhoods in our cities and towns. It has been doing this for over 10 years. With the emphasis on welfare reform, I think it is important to note that some of the ancillary activities like employment programs and day care are being funded under CDBG. So it is an integral part not only in revitalizing our cities, but in helping to assist with true welfare reform.

We hope that your committee will not recommend that the 312 loan portfolio be sold off, because that system is important. We use almost $100 million a year in loan repayments. It is a very effective program that has been in force for a long time.

PUBLIC HOUSING

In terms of public housing, we have two principal objectives: One is to make public housing fiscally sound, and that means an adequate operating subsidy, an adequate subsidy to, in addition to meeting the needs, do two catch-up things: One, to cover increases in insurance costs which the Congress directed the administration to do; and two, to leave some funds available to pay housing authorities back for the monies that HUD recaptured several years ago.

HUD has agreed to do that if there are funds available. The other important thing in the existing public housing is to provide adequate funds to renovate properties that have fallen into disrepair. I think the principal reason they have fallen into disrepair is since the PFS came into being in 1974, it recognized that there should be a maintenance replacement reserve so repairs can be made regularly. That maintenance replacement reserve has never been funded, so it is almost that property has to get really bad to get major funding. The authorization bills are talking about a comprehensive grant program which will solve that problem.

Finally, the section 8 program is an important program, especially the moderate rehabilitation component of it, which has done two things. It has provided good housing for low-income families, and it has renovated housing in our cities that, without that renovation, would have been substandard and eventually would have had to be torn down.

So it has preserved it. Those are the points I wanted to make.

Senator PROXMIRE. Thank you very much, Mr. Adams. You stay where you are. I may have a question for you.

[The statement follows:]

STATEMENT OF MELVIN J. ADAMS, PRESIDENT, NATIONAL ASSOCIATION OF HOUSING AND REDEVELOPMENT OFFICIALS

Mr. Chairman, I appreciate the opportunity to appear before you and your Subcommittee today. I am Melvin J. Adams, Assistant Director of the Montgomery County, Maryland, Housing Opportunities Commission and President of NAHRO, a 53-year-old association of professionals who administer low-income housing, neighborhood revitalization, and community development programs in localities across the country. We represent over 2,300 agencies and 5,600 individuals involved in carrying out these programs.

NAHRO appears before you at a difficult time. The Congress and this Subcommittee are still wrestling with the federal deficit. The Congress has yet to reach a consensus on the FY '88 Budget Resolution. We hope and anticipate that our funding request will not be inconsistent with the Budget Resolution when passed by the Congress.

Let me reiterate NAHRO's position, first stated 14 months ago. We agree the federal deficit must be reduced; however, the domestic programs, particularly housing and community development, have already suffered not only disproportionate, but life-threatening cuts and should not face the further burden of deficit reduction. To accomplish the latter and still reduce the federal deficit, NAHRO supports a revenue increase dedicated specifically to deficit reduction. Such action will halt the hemorrhaging of vital domestic programs and allow resumption of their full role and function. This is the only realistic action in light of the current budgetary situation. It is our hope (and we urge) that such an approach be adopted by the Congress and supported by the Administration for fiscal year 1988.

Despite the level of activity of prior years, the provision of decent housing for those who cannot afford it and the repair and replacement of aging infrastructure and public facilities are a continuing challenge requiring a continued and substantial federal commitment. Visit almost any city in the country today and you will see signs of physical decay and the need for additional housing. The magnitude of the problem, and the competition for local and state dollars, precludes state and local governments from providing sufficient resources to successfully overcome the problem of deteriorated neighborhoods, under-housed and ill-housed people of low income. This Subcommittee has heard testimony from representatives of state and local governments who attest to the impossibility of the needs being met by their current funding sources. And, despite an increase in the participation of state and local governments in funding and supplementing programs in housing and community development, the gap between need and funding availability will remain. The federal government must continue to participate in partnerships with local and state governments and to provide the resources and programs to effectively deal with the problems of housing and community development.

I am here on behalf of NAHRO to advocate specific funding levels for FY '88. But first let me take this opportunity to express our appreciation to this Subcommittee. Despite the pressures to do otherwise, you have been firm supporters of the housing and community development programs and have shown this support by funding them at reasonable levels. Communities across this country have benefitted greatly from this continued program funding. They are hopeful that at a minimum you will maintain last year's funding levels so that these programs continue to operate successfully, and continue to serve the needs of low- and moderate-income people.

Community Development

The programs funded in the community development area are the last few sources of federal assistance that localities have to address the growing problems of physical decay. Local and state resources alone are not sufficient to address this serious problem. Community development programs funded by HUD have proven to be extremely valuable in helping cities address these problems.

NAHRO recommends the CDBG program be funded for FY 1988 at a level of $3.12 billion. To address the complex problems of fiscal constraint, unemployment, economic restructuring, deteriorating infrastructure, deteriorating neighborhoods, and shortages of decent, affordable housing for its citizens, communities have successfully utilized the CDBG program. Commmunities have utilized this program to create livable neighborhoods, housing opportunities, and new jobs. Significant private and other public investment has been staged to leverage the CDBG resources.

The primary objective of the act of providing benefits to low- and moderate-income persons has been met through such activities as the provision of social services to low-income individuals or housing rehab loans or other activities that improve the neighborhood where lower-income people live. Public service activities such as day care and assistance to the elderly or handicapped also receive substantial amounts of direct benefit funds. The track record of the CDBG program is clear. It has contributed significantly to the physical improvement of our communities and has significantly benefitted low- and moderate-income persons.

The accomplishments of the CDBG program in individual cities are staggering if you consider that the number of communities receiving funds from the entitlement portion of the block grant has increased from 594 in 1975 to 837 in 1987. Concurrently, the increase in the number of entitlement communities has been accompanied by a decrease in funding, therefore forcing communities to try to do more with less. In addition to the 837 entitlement communities, the program currently serves some 2,500 small communities annually. The numbers of beneficiaries and the proven accomplishments of the program clearly justify as a minimum the funding level proposed by NAHRO of $3.12 billion for FY 1988.

NAHRO recommends a funding level of $330 million for the Urban Development Action Grant program (UDAG). UDAG, more than any other program administered by the Department, has significantly contributed to leveraging private investment. The program has produced over $32.7 billion in total investment, with 80 percent of that sum coming from non-UDAG source. This investment has occurred in some 2,700 plus projects in more than 1,100 cities. A significant yet frequently overlooked fact is that the improvements generated by the UDAG program have also generated an additional $600 million annually in local tax revenue, thereby helping the steadily deteriorating tax base of our local governments. More than half of the 550,000 new permanent jobs created by UDAG have gone to lower-income persons. About 30 percent of UDAG projects fund housing and neighborhood projects which in turn have produced 107,000 new and rehabilitated units of housing, many of which have been reserved for lower-income families.

Again, statistics of the program accomplishments since its inception clearly make the case for continued funding of the Urban Development Action Grant program. During this time of encouraging private investment to assist with the problems of our communities, we need to recognize the enormous value of the UDAG program to this approach. A $330 million appropriation for FY 1988 will produce in excess of $2 billion of capital investment at the local level and untold numbers of jobs for low-income persons.

The Rental Rehab and HoDAG programs should be funded at the level of $150 million and $99.6 million, respectively. These two relatively new programs are just getting off the ground and are proving to be successful in terms of accomplishing their statutory objectives. The Congress should continue to recognize the value of these approaches by continued funding at the suggested levels during FY 1988.

As NAHRO has each year, we ask for continued funding of the Section 312 Rehabilitation Loan program. This is a program which over the years has not only provided the resources to rehabilitate residential and in some cases commercial units, but has been the stimulus for locally funded rehabilitation programs. The 312 program currently does not require any newly appropriated dollars. It merely survives off the repayments to the loan fund. We strongly urge the Congress to not only permit, but require, the utilization of those loan repayments for additional 312 Rehab loans. We also oppose any attempt to sell any of the loan portfolio.

Public Housing

There is no program as successful at housing over four million low-income people as the Public Housing program. Much is made about the problems of selected public housing programs around the country, to such an extent that there has been an erosion of support for this program. I testify before you today that the Public Housing program is successful in the provision of decent, safe and sanitary housing to the majority of its residents. The public housing industry is making every effort to insure that all who are housed in public housing reside in a decent, safe and sanitary unit. This goal can only be accomplished through the continued federal support of the Public Housing program.

NAHRO estimates the public housing operating subsidy needs for FY '88 at $1.544 billion. This $1.544 billion will provide funding for 100 percent of the

Performance Funding System allocation to PHAs, in addition to an additional $100 million to cover costs beyond control, appeals, and additional insurance costs. We strongly urge that this be newly appropriated funds. Any remaining operating subsidy funds from FY '87 should be available for allocation by HUD. Consistent with Congressional directive, HUD must utilize some of these funds to help PHAs meet increased insurance costs. In addition, HUD has signed an agreement with PHA representatives (NAHRO and PHADA) agreeing to receive claims from PHAs and make compensatory payments for income recaptured during the period 1980 through 1986 which PHAs allege should not have been recaptured. In order to fulfill this commitment, HUD needs any funds remaining from FY '87 to make those payments. If there is a balance owing PHAs after FY 1987 because HUD has been unable to pay (due to the unavailability of those funds), NAHRO urges this Subcommittee to appropriate such funds for use during FY '88. If that amount is not identified by HUD prior to the conclusion of deliberations by this Subcommittee, it is hoped that this Subcommittee will take action during the course of the year through a supplemental to provide the necessary funds.

NAHRO's recommendation for Public Housing Modernization funding is to hold that level with FY '87 at $1.437 billion. The long-awaited Abt study has been received (at least a portion thereof) and is currently being reviewed by HUD and public housing agencies. It is clear from even a cursory look at the Abt results that the modernization needs for public housing would begin at $21.9 billion. Consequently, the requested level of $1.4 billion is not ina ppropriate to the considerable need for modernization funding. It is hoped that the Abt study, HUD and the industry can reach some understanding during the course of the next year so that we can have a agreement on the continuing funding requirements for modernization of public housing and establishment of a funding system for future needs or a replacement reserve system.

NAHRO strongly urges funding during FY '88 sufficient to produce 20,000 new units of conventional public housing. It is our estimate that the current waiting lists for public housing around the country number in excess of 800,000 families. Despite alternative programs offered by the federal government and state and local governments, it is readily apparent that new public housing is necessary. There is a great housing need in this country; in some market areas the vacancy rate is so low that new units are the only way low-income persons will find housing. And the fact is that it makes sound fiscal sense to produce permanent new units to house low-income families. NAHRO estimates the overall vacancy rate in public housing at four percent -- well below the 7.7 percent vacancy rate for all rental housing. The long-term costs for such units are less burdensome and not as costly as other short-term "quick fix" alternatives. NAHRO feels strongly that new public housing is a necessary ingredient to any urban strategy, whether from the national or local perspective.

Assisted Housing

The value and contribution of the Section 8 Existing program is unquestioned. As a result, this program should be funded at the level of 60,000 units. NAHRO makes this recommendation with full knowledge that Section 8 Existing Certificates carry with them a 15-year authorization as opposed to the five-year authorization of the Housing Voucher program. That is clearly an advantage of the Certificate program over the Voucher program, though it adds to the initial authorization. Furthermore, the Voucher program has just begun and is literally still being tested. We urge completion and evaluation of the test period to determine the true effectiveness of the Voucher program before fully implementing and funding this program. We also urge sufficient funding for the Section 8 Existing program and Vouchers (if any are funded) to permit the payment by HUD to a PHA of an Administrative Fee at 8.5 percent. The Administrative Fee is a major issue and one which we have fully presented to the authorizing Committees. As a result, we anticipate that admin fee provisions will be included in authorizing legislation during this session.

The need for, and the success of, the Section 8 Moderate Rehabilitation program clearly justifies the NAHRO recommended funding level of 20,000 units. This program has achieved a significant level of success across the country and is clearly a valuable tool in utilizing the existing housing stock for purposes of housing low- and moderate-income persons. Continued funding is essential to accomplish the national objective.

The HoDAG program should be funded at the level of $99.6. Again, this is a new program which is just getting off the ground and should have some continued funding to truly test its effectiveness. Even in this "testing period," the program is clearly providing housing resources for low-income persons and such an opportunity should be continued.

NAHRO appreciates the opportunity to testify before this Subcommittee in support of housing and community development programs. We sincerely hope that you will fund the programs at the levels we have recommended. In further support of this testimony, I have attached to our written statement copies of NAHRO position papers on major issues before the Congress this year. We hope that you will seriously consider these positions and reflect them in the bill reported out by this Committee. Thank you again for the opportunity to present our views.

FUNDING LEVELS FOR SELECTED HOUSING AND COMMUNITY DEVELOPMENT PROGRAMS

(add 000,000 to dollar figures)

Program	FY 1986 Appropriation	FY 1987 Appropriation	FY 1987 Proposed HUD Changes	FY 1988 HUD Proposed	NAHRO Recommendations for 1988
Public Housing Units - Conventional	3,993	2,500	--	2,500	20,000
Public Housing Units - Indian	2,078	2,000	2,459	1,000	2,000
Section 202 Units	11,515	12,000	10,274	2,000	12,000
Section 8 Existing Certificates	29,853	10,000	9,649	--	60,000
Section 8 Moderate Rehab Certificates	9,413	7,500	5,075	--	20,000
Housing Vouchers	35,002	48,949	--	79,000	--
CDBG	$ 2,990	$ 3,000	$ 2,625	$ 2,625	$ 3,120
UDAG	$ 316	$ 225	$ 20	--	$ 330
Rental Rehab	$ 72	$ 200	$ 95	$ 75	$ 150
Section 312 Loans	$ 40	$ 91	$ 85	--	$ 96
HoDAG	$ 72	$ 99.6	--	--	$ 99.6
Public Housing Modernization	$ 1,441	$ 1,437	$ 1,000	$ 1,000	$ 1,437
Public Housing Operating Subsidy	$ 1,159	$ 1,350	$ 1,438	$ 1,462	$ 1,544

NEW BUDGET AUTHORITY REQUIRED TO SUPPORT NAHRO'S FY 1988 RECOMMENDATIONS FOR HUD-ASSISTED HOUSING

(000 added)

Program	Units	Per Unit Authority	Term (years)	Budget Authority
Public Housing - Conventional	20,000	$6526*	30	$ 3,915,600,000
Public Housing - Indian	2,000	**	NA	143,041,706
Section 202	12,000	6912	20	1,658,880,000
Section 8 - Existing Certificates	60,000	5468*	15	4,921,200,000
Section 8 - Moderate Rehab	20,000	6389*	15	2,555,600,000
TOTAL	114,000	--	--	$13,194,321,706

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*Based on FY 1987 cost factors.
**Based on a total development cost of $71,521 per unit.

SOURCE: FY 1988 Budget, U.S. Department of Housing and Urban Development, January, 1987.

Senator PROXMIRE. I want to make sure again that the people that I called earlier are here. Several people have entered the room since then.

Janet Charlton, National Leased Housing Association? Would you come to the front of the room and take a microphone?

Gordon Cavanaugh? Sir, will you be seated at the witness table?

Rich Mapp? Is Richard Mapp here? James Abbott? Fine.

Ms. Charlton, go ahead. You have 4 minutes.

STATEMENT OF JANET CHARLTON, EXECUTIVE DIRECTOR, NATIONAL LEASED HOUSING ASSOCIATION

Ms. CHARLTON. Thank you. I am sorry for being a little bit late. My name is Janet Charlton. I am executive director for the National Leased Housing Association [NHLA], a group which represents more than 750 member organizations involving rental housing, public housing facilities, developers, managers, nonprofits, financiers, and syndicators. All of our members share an overriding concern for the provision of affordable rental housing for low- and moderate-income Americans, which is what brings us before you today.

ASSISTED HOUSING PROGRAMS

Our primary purpose here today is to urge this committee to fund the assisted housing in fiscal year 1988 at the fiscal 1987 appropriations level. Since 1981, budget authority for assisted housing programs has been cut by 66 percent. Total cuts would have been increased to 87 percent had the administration's fiscal year 1988 budget plan been accepted.

Although specific programs should always be subject to thorough examination, we must never lose sight of the commitment set forth 50 years ago in the United States Housing Act of 1937 that the government has an essential role to play in assuring that every American is adequately housed.

Even as more reliance is placed on existing housing through such sound programs as PHA-administered section 8 certificates, an obligation must be assumed to assure that the affordable housing stock exists in the first place.

Whether such stock is produced through deep or shallow subsidies and the interplay between federal, state, or local action are subjects for fair debate. We must take this opportunity to again stress, not only the importance of maintaining the dollar funding level, but also the programs targeted for funding. NLHA urges continued support for the section 202 program, the Housing Development Grant Program [HoDAG], and the section 8 existing and moderate rehab programs.

The administration's band-aid approach of using vouchers to solve all of assisted housing's problems is very ill conceived. NHLA has long been on record in support of continued incremental funding for the section 8 existing housing certificate program, a program proven to be the most cost effective and efficient in the history of government-assisted housing.

In recognition of the lack of availability of affordable existing housing in some areas, it is also important to maintain a proper balance of housing programs. To this end, we emphasize our continued strong support for the development of needed units through programs such as the HoDAG program.

LOW-INCOME HOUSING INVENTORY

In the next few years, policies and funding affecting assisted housing, management, and reservation will increase in importance as the essential tools for maintaining our low-income housing inventory. Figures document that a dramatic decline could occur in subsidized units during the late 1980's and early 1990's, assuming owners opt out of section 8 or section 236 programs when their contractual obligations expire.

While such options and incentives will require some kind of funding, such funding will prove a much less expensive way of maintaining the present quality of inventory rather than allowing the older projects to go out of inventory and perhaps be replaced by costly new constructive ones.

As I am sure you are aware, the Housing Subcommittee and the full committee markup next week is looking at incentives and priorities to be used in maintaining the housing inventory stock. In recognizing the federal role of low-income rental housing, NHLA stresses the need for this subcommittee to be aware of and sensitive to the urgency of this issue.

We ask that you examine the various policies and procedures which are under discussion and grant approval in the future for the use of recaptured or other funds when necessary to maintain a project's low-income character.

This issue will only continue to grow in importance in the coming years, and we look forward to working with the subcommittee to ensure workable solutions.

Thank you.

Senator PROXMIRE. Thank you, Ms. Charlton, very much.

[The statement follows:]

STATEMENT OF JANET S. CHARLTON, EXECUTIVE DIRECTOR, NATIONAL LEASED HOUSING ASSOCIATION

My name is Janet S. Charlton. I am Executive Director of the National Leased Housing Association on whose behalf I am testifying today.

The National Leased Housing Association represents more than 750 member organizations involved in multifamily rental housing - - public housing authorities, developers, managers, non-profits, financiers and syndicators. All of our members share an overriding concern for the provision of affordable rental housing for low and moderate income Americans. It is this concern which brings us before you today.

Our primary purpose here today is to urge this Committee to fund assisted housing in FY88 at the fiscal 1987 appropriations level.

The Congress, in budget action, has wisely rejected the Administration's proposals to reduce or terminate housing and development programs, sell off HUD loan assets, and transfer some fiscal 1987 funding to fiscal 1988 in lieu of new appropriations. Since 1981 budget authority for assisted housing programs has been out by 66 percent. Total cuts would have been increased to 87 percent had the Administration's FY88 budget plan been accepted. We can not emphasize too strongly that assisted housing has already taken its fair share, and more, of budget reductions. Although specific programs are subject to thorough examination, we must never lose sight of the bottom line conclusion that the federal government has an essential role to play in assuring that every American is adequately housed. Even as more reliance is placed on existing housing through such sound programs as PHA administered Section 8 Certificates, the government has the obligation to assure that the housing stock exists in the first place. Whether such stock is produced through deep or shallow subsidies and the interplay between federal, state or local action are subjects for fair debate. But the traditional federal role in low income rental housing production must continue.

We must take this opportunity to again stress not only the importance of maintaining the dollar funding level, but also the programs targeted for funding. NLHA urges continued support for the Section 202 program, the housing development grant program and the Section 8 existing and moderate rehabilitation programs.

The Administration's band-aid approach of using vouchers to solve all of assisted housing's programs is very ill-conceived. NLHA has long been on record in support of continued incremental funding for the Section 8 existing housing certificate program, a program proven to be the most cost-effective and efficient in the history of government assisted housing. The voucher program remains largely untried and unevaluated. Indeed early statistics from the New York Housing Authority and the Boston Housing Authority reveal that vouchers can be significantly more costly that certificates on a per unit basis. We urge this committee to reverse last year's program mix and to fund, pending authorization legislation, an additional 50,000 units of Section 8 existing and 10,000 vouchers on a continued demonstration basis.

In recognition of the lack of availability of affordable existing housing in some areas, it is important to maintain a proper balance of housing programs. To this end, we emphasize our continued strong support for the development of needed units through programs such as the housing development grant (HoDAG) program.

Future Priorities

In the next few years, policies and funding affecting assisted housing management and preservation will increase in importance as the essential tools for maintaining our low income housing inventory. The June 1986 GAO report entitled Rental Housing - Potential Reduction in the Privately Owned and Federally Assisted Inventory documents a dramatic decline in subsidized units expected during the late 1980's and 1990's assuming owners opt out of the Section 8 or Section 236 program when their contractual obligations expire. A drop of one million units in inventory could result from 1985 to 1995. The House Subcommittee on Housing and Community Development has held hearings and is currently examining various options and incentives in H.R. 4 which may be offered an owner to keep a project in the assisted housing inventory. We understand that the Senate housing subcommittee is also expected to hold hearings on the issues of prepayment and preservation before a House-Senate authorization conference is convened. While such options and incentives will require some kind of funding from the federal government, such funding will prove a much less expensive way of maintaining the present quantity of inventory rather than allowing the older projects to go out of inventory and be replaced by costly, new constructed ones. In recognizing the federal role in low income rental housing, the members of NLHA stress the need for this subcommittee to be aware of and sensitive to the urgency of this issue. We ask that you examine the various policies and procedures which are under discussion and grant approval for the use of recaptured or other funds when necessary to maintain a project's low income character. This issue will only continue to grow in importance in the coming years and we look forward to working with this subcommittee to ensure workable solutions.

Thank you for allowing us to share our thoughts with you.

STATEMENT OF GORDON CAVANAUGH, COUNCIL OF LARGE PUBLIC HOUSING AUTHORITIES

Senator PROXMIRE. Gordon Cavanaugh, Council of Large Public Housing Authorities [CLPHA]. You are pinchitting for a dear friend of mine, he used to be on my staff, Bill Drew.

Mr. CAVANAUGH. We are sorry, but Mr. Drew, I believe it was yesterday, went in for unexpected emergency surgery.

Senator PROXMIRE. I understand he had an operation. Go right ahead, sir.

Mr. CAVANAUGH. I am stepping in big shoes, but I would like to present what I think he would have said to you without, perhaps, some of the Milwaukee flavor that he would have been able to add.

BUREAUCRATIC OPPOSITION

Certainly, first of all, for CLPHA and everybody in public housing, we welcome your return as chairman of this subcommittee, and during the 7 years you have been out of the seat, outside the subcommittee, our problems have been very dramatic in that we faced a great deal of bureaucratic opposition in HUD to the program. We have had constant efforts from HUD to take away funds that were given to us by statutes, and of course, we have virtually lost the development program.

Inside the committee, we felt that we have had a great deal of lifesaving support, and I think all of us—I am sure Bill Adams will join me—feel that public housing has survived largely from the support in the appropriations subcommittees.

The catch word in Washington since the beginning of the session has been "the homeless." I would just like to point out that you can't disconnect the lack of building any units for the past 7 years of any number from that problem.

Public housing waiting lists are limitless. There are almost 1 million households on public housing waiting lists now. The Conference of Mayors reported recently that 68 percent of the PHA's that had survived had closed their waiting lists. They wouldn't take applications any more.

Public housing is record low turnover, down to 3 or 4 percent from at least my experience, which should be 10 or 15 percent. Senator, you were good enough to hear the CLPHA presentation about a month or two ago about doubling up in public housing. New York City alone feels they have one-quarter to one-third of their units double occupied. Of course, the flow of units is down to what is just a trickle.

REBUILD PUBLIC HOUSING DEVELOPMENT PROGRAM

So we urge, in the first instance, a rebuilding of the public housing development program beyond this kind of breath on the mirror state that we have at 5,000 units a year.

We know of your deep concern, and we share your deep concern, for the deficit, but I think housing people can come here with clean hands. We have gone from a $30 billion level when you last sat in that chair to about a $7.9 billion level. It looks bad for the lobbyists, among other things, but somebody asked me how we had fallen so badly and who was working on it those years.

But that aside, we have fallen on bad times. We don't think that we should have to hear, I don't mean from you, but from the administration, all the deficit talk. If everybody had taken the cuts we had, there wouldn't be a deficit.

REHABILITATION OF PUBLIC HOUSING

Next, kind of the vittles of the program, as Bill Adams was mentioning, is the rehabilitation of the existing stock. Many of those units are 40 and 50 years old. We have been making, I think, good headway with the modernization program, indeed, particularly good headway through the last 7 years, largely from the protection of this and the House counterpart committee.

We believe that public housing tenants, notwithstanding some popular images, are indeed vastly better housed now than they were at the beginning of the eighties. More than that, the rehabilitation of public housing is very cost effective. There have been literally hundreds of millions of dollars saved in operating subsidies as a result of making the projects energy efficient in a whole host of ways.

We talk in other quarters of the Congress and the press about improving the American and preserving the American infrastructures of bridges and the highways and the like. We would like to see that that same notion be extended to the basic responsibility of shelter.

We all know that the figure to do all of that is a $21.5 billion amount. If we see inadequacies in public housing, the modernization needs assessment study originally sponsored by this subcommittee has now produced a report that even HUD describes as an accurate, well-done study that says we are $21.5 billion behind.

We urge Congress to move to a level of rehabilitation that begins to make headway on the findings of that report, not that we just keep pace with the current deterioration, but that we move forward in digging more deeply into the backlog of needs. We are urging that the appropriation be raised to a figure of $1.75 billion.

Senator PROXMIRE. Can you summarize? Your time is up.

OPERATING SUBSIDIES

Mr. CAVANAUGH. Yes, all right. The last thing that we would say is simply that we need badly the full level of operating subsidies. We have been asked, since the CBO and the budget resolution figure is $1.5 billion, I am advised by the Budget Committee, why are we asking for $1.7 billion? Our testimony lays out that we have been shortchanged at least $100 million in each of the last 4 years on insurance costs that HUD refuses to reflect in the performance funding base.

I will just conclude by saying, as the Congress is now seeing with opt-outs, expirations, prepayments, and much of the private market getting out from under, this subsidized housing issue of public housing, I think, shows the value of this program. It is still there taking care of 3.5 million of the contry's poorest citizens.

Senator PROXMIRE. Thank you, Mr. Cavanaugh.

[The statement follows:]

Statement of William Ryan Drew, Commissioner, Milwaukee (Wis.) Department of City Development

Senator Proxmire and members of the Committee, my name is William Drew. I am the Commissioner of the Department of City Development in Milwaukee, Wisconsin, an agency which includes the Milwaukee Housing Authority. I am testifying here today on behalf of the Council of Large Public Housing Authorities (CLPHA), an organization whose members manage about 40% of the 1.3 million units of conventional public housing units in the country, plus hundreds of thousands of Section 8 "existing" and "mod. rehab" units. Our member PHAs and residents are very grateful for the support shown by this Committee for the public housing program over the years.

Without Congress' support, the public housing program wouldn't be alive today. Congress has preserved this essential program through seven years of unprecedented attacks, attacks which have ignored the fact that public housing is, over the long run, the most cost-effective way of providing housing to low-income households.

CLPHA also recognizes that the deficit is still with us. Yet, at the same time, housing costs in some cities have grown so high and housing availability so low that the children of even the middle class can no longer afford to live where they grew up, and the crisis among the poor has grown into the daily agony of homelessness.

Those who live in, or manage, the large Public Housing Authorities know the problems of the homeless well, since they are on our waiting lists. The first response of social welfare agencies and of the poor themselves when they face homelessness is to apply for public housing. There are almost a million households on public housing waiting lists now. The turnover tends to be very slow, so the homeless on those lists will remain homeless for a long while unless we can build more housing.

This crisis has affected our own Housing Authorities in a variety of serious ways. In many areas, such as New York City, the problem of doubling-up in public housing is becoming daily more acute. In addition, the U.S. Conference of Mayors did a survey last December and discovered that the waiting lists of PHAs in 68% of the major cities surveyed had been closed by the Authorities, due to lack of availability of units.

Also, as we discussed with you, Senator Proxmire, at our meeting with you in February, the cost of "temporarily" housing the homeless by putting them in hotels is far greater than housing these same households in public housing.

We recognize that mistakes have been made in the design of public housing in the past. No one wants to build high-density family hi-rise "projects" any longer. The design of new public housing has been significantly improved. The very low-income population has also become more diverse, and is now characterized by greater variety and special needs. And more Housing Authorities are acting as "information centers" for the residents, distributing information about job training, day care for working mothers, adult and child education, and health services in order to help their residents to become economically more self-reliant.

We therefore hope that Congress can begin to get the public housing program moving again. The housing problems of the poor and the homeless require long term solutions, not "quick fixes."

DEVELOPMENT PROGRAM

Without any question, the best thing that has happened to the public housing program in recent years is Congress' continued and steady support for operating subsidies and rehabilitation funds. While these programs are in relatively good order and moving along well, we think the time is now ripe to get the development program rolling again, too.

The vast majority of the public housing program in this country is successful, given the immense and difficult problems which the program must address. It is the work-horse among the nation's housing programs for the poor. It is not only the largest of those programs, but it houses the very poorest population, and it works in large cities and small towns throughout the nation. It serves very low-income families, the elderly and the handicapped. It is also the cheapest in cost among the assisted housing programs over the long run, and it has been proven through eight Administrations over 50 years. It belongs to the people of this nation: it represents billions of dollars worth of invested tax money, an investment which must be preserved.

Yet, an amendment last year in the House of Representatives to restrict additional public housing development passed overwhelmingly. Even before that, authorizations for new public housing development had been cut so low, and the Reagan Administration had imposed such tight restrictions on development, that many Authorities found it impossible to build.

The current program level of 3,000 to 5,000 units per year is barely enough to keep this program going. Even for the most modest kind of program, that's hardly enough to scratch the surface of the problem of homelessness. While CLPHA has advocated for a level of 15,000 units per year in the past, we recognize that the operating subsidy and rehabilitation funds are major priorities. We know that you have these concerns, too, and we would be glad to take your policy guidance in the appropriations of development money; but the current level is too feeble. Once the muscle of this program dries up, and the administrative structures to carry it out have been shrunken, the program stops working at all. We ask you to keep it in reasonable shape.

PUBLIC HOUSING REHABILITATION

The first report of the HUD/ABT study of national rehabiliation needs in public housing has now been turned in by the contractor, and indicates a verified backlog of need of about $21.5 billion nationwide. Although great strides have been made in improving the public housing stock over the past six years under the CIAP program, the distance left to go is still great. This is not suprising for a program which originated 50 years ago, in 1937, and which for many decades went severely underfunded in terms of its capital improvement needs.

In testimony recently before Congress, Dr. June Koch of HUD's Office of Policy Development and Research stated that this was "an accurate, well-done study." We look forward to having the remainder of this important study completed, and, even more important, to using it to shape the future of the public housing rehabilitation program.

CLPHA would request that your Committee keep two important principles in mind:

(a) the annual rehabilitation funding level should be enough to make progress in reducing the backlog of accumulated rehabilitation needs as well as offset on-going current wear-and-tear as it occurs; and

(b) the funds should be targeted according to where the needs are, and should not just be spread around without regard to need, which can waste the available funds.

PHAs across the country are now completing five-year modernization plans in what is undoubtedly the most thorough and comprehensive planning process for public housing that has ever been undertaken. We believe it makes sense to use the Abt study to allocate available funds to the HUD field office levels, which the study was statistically designed to make possible. Within field office areas, the funds could then be allocated to individual PHAs based upon their HUD-approved five-year modernization plans. These plans and needs estimates are going to be updated annually in the future, and should form the basis for a new and improved management system on HUD's part for the administration of modernization funding.

We've heard much talk about maintaining our nation's infrastructure--bridges, roads, etc. -- but the infra-structure of our low-income housing supply also needs to be maintained.

We therefore urge you to appropriate $1.75 Billion for rehabilitation in FY88. There is no question that we can use it expeditiously.

OPERATING SUBSIDIES

On operating subsidies, PHAs have been shortchanged hundreds of millions of dollars over the past several years because HUD's "Performance Funding System" (PFS) formula explicitly excludes a separate inflation factor for the real insurance and related risk-protection costs of the Housing Authorities. While this methodological omission was not originally adopted with any malicious intent, the result has been that the rapid rise in insurance costs of PHAs since 1980 has played havoc with PHA budgets.

Many PHAs have had to lay off employees. Just as seriously, other PHAs have "gone bare" on insurance coverage, with waivers of ACC requirements from HUD. As Dr. Baugh of HUD testified recently, most of these waivers will expire on June 30.

Last year, in the FY87 Appropriations report language, Congress directed that HUD "shall" allocate any extra FY87 operating subsidy money to the PHAs for their extra insurance costs. To date, this has not been accomplished.

HUD appears to be making real progress in developing an allocation methodology, and we are very encouraged by what HUD says it is considering. This motion is not rapid, however, and "money delayed is money denied." Progress often seems minimal unless your committee keeps pressing on the Department to make it move. We ask you, therefore, to keep up the pressure.

SECTION 8/VOUCHERS

CLPHA urges that no additional appropriations for vouchers be provided until the results of the Voucher Demonstration are much more fully known. HUD received the contractor's first Interim Report on the Voucher Demonstration in January 1987, almost four months ago, but continues to keep the results highly secret except for very selective "leaks". Recently, Dr. June Koch, HUD Assistant Secretary for Policy Development and

Research, testified that half of all voucher recipients in the Demonstration are paying over 29% of their income for rent, with the range of rent burdens varying from under 20% of income to over 50%! Also, 26% of all voucher recipients are paying 40% or more of their incomes for rent. Clearly, this "new HUD initiative" results in much more of the burden of housing assistance programs being shifted onto the backs of low-income people themselves.

In spite of these distressing figures, vouchers also reportedly cost HUD $23 per month more than Section 8 "existing" certificates, largely because, under the "existing" certificates, the subsidy is calculated based upon either the FMR or the actual rent, whichever is lower. And under Section 8 "existing", recipients find housing that has lower average rents. The PHAs report that, to a large extent this is because of the assistance of the Housing Authorities.

Congress has given HUD ample opportunity, by providing funds for the Voucher Demonstration, to show how vouchers might work. HUD's reluctance to reveal the initial results of the Demonstration lends evidence to the suspicion that its claims are not backed up by the facts. We urge you, therefore, not to appropriate further funds for incremental vouchers at this time, but instead to expand the funding for Section 8 "existing" and "mod. rehab.", two time-tested and successful programs.

If the Demonstration shows that there are real advantages to allowing a somewhat wider range of rents and rent-income ratios, these can be introduced in the future as limited changes to the "regular" Section 8 programs.

SERVICES IN PUBLIC HOUSING

Last summer, CLPHA asked its members about the housing-related programs they were running. These stories appeared in two publications, "New Directions in Public Housing", and Public Housing Today, both published by CLPHA last fall. I was surprised at the response. Virtually every authority had some sort of program and the emphasis clearly was on education and job training (including literacy and computational skills) to help residents attain greater economic self-sufficiency.

These programs in public housing are financed from a variety of public and private sources; they exist throughout the country, and they are growing more and more important and needed.

This is so because public housing is the home of three and a half million poor people. As residents and Directors of public housing, we can see every day what many very low-income households are up against. The response is the variety of programs sponsored by authorities.

It is time that tangible help be provided to PHAs in this effort, particularly in education, job training and day care. CLPHA has therefore drawn up a bill we call the Public Housing Gateway bill. This legislation would provide a modest demonstration program to target services to public housing residents. The program is designed not to duplicate existing services, but to permit the Authorities to coordinate, purchase, or in a few instances, directly provide services to its tenants.

The Authority's management skills, the added advantages of on-site physical facilities and a ready public housing community make PHAs a logical team to coordinate the delivery of these services. Ultimate fiscal responsibility for these services would rest with federal labor, health, human services and education programs. We would hope, however, that members of your Committee might consider co-sponsorship for this legislation.

In conclusion, let me summarize the most important points in my testimony today. First is the need for additional public housing. Second is the need for adequate operating subsidy and rehabilitation funds. Third is to not add more vouchers for now but instead to add to the Section 8 "existing" and "mod. rehab." programs. Fourth is the need for expanded efforts by the PHAs to help residents achieve greater economic self-sufficiency.

OPERATING SUBSIDIES:	$1.7 billion
REHABILITATION:	$1.75 billion
SECTION 8/VOUCHERS:	No incremental units of vouchers; put all additional funds into Section 8 "existing" and "mod. rehab."

Well, enough, Mr. Chairman. Let me end by thanking you and the members of the committee for having us here, to speak of the strength and vitality of this beleaguered but still vitally necessary program.

STATEMENT OF JAMES ABBOTT, MORTGAGE BANKERS ASSOCIATION OF AMERICA

Senator PROXMIRE. Our next witness is Mr. James Abbott, First Union Mortgage Corp., Mortgage Bankers Association.

Thank you, Mr. Abbott.

Mr. ABBOTT. Thank you very much, Mr. Chairman and members of the subcommittee. I am James Abbott, president and chief executive officer of First Union Mortgage Corp. of Charlotte, N.C., and a member of the executive committee of the Mortgage Bankers Association of America [MBA].

We appreciate the opportunity to appear before you today. We will focus on the necessity of establishing an adequate credit budget limit for the Federal Housing Administration's [FHA's] Mortgage Insurance Program and sufficiently high guarantee authority for the Government National Mortgage Association Mortgage-Backed Security Program.

We will also discuss the VA Home Loan Guaranty Program. MBA urges the adoption of an FHA credit ceiling of at least $100 billion for fiscal year 1988. Activity in fiscal year 1986 totalled $102.6 billion, and in the first six months of fiscal year 1987, FHA activity was approximately $50 billion.

It appears that the FHA's $100 billion ceiling for fiscal year 1987 may be inadequate as a result of activity today. It also appears that FHA's appropriation to cover the fees of outside personnel to perform loan processing steps may also run out before the end of fiscal year 1987.

VA HOME LOAN PROGRAM

The VA home loan program has traditionally not been subject to appropriated authority ceilings because it has always been an entitlement program. If budget deficit targets are not met and sequestration does take place under the Gramm-Rudman-Hollings Act, MBA believes an estimated level of activity of at least $40 billion for fiscal year 1988 is appropriate for the VA Home Loan Program.

MBA believes that the VA Home Loan Program is insufficiently staffed as evidenced by delays in loan processing and the review of appraisal reports as well as delays in processing foreclosures of loans.

In some instances, these foreclosure delays have resulted in no bids, which have a severe impact on mortgage lenders who participate in the VA program. Because of these delays, interest accrual during this period increases a veteran's indebtedness to the point where the VA, in accordance with the claim payment formula in the Deficit Reduction Act of 1984, pays the lender only the guarantee amount and leaves the lender with a property that, in most cases, has depreciated in value.

LOSSES SUFFERED BY LENDERS

As a result of regional economic problems and inadequate VA staff, lenders suffered losses of $86 million in 1986 and, to deal with this shift in risk, has been forced to make business decisions that will result in mortgage credit being more difficult or impossible for veterans to obtain. In certain economically depressed areas of the country, such as the Southwest, lenders have not only tightened their underwriting criteria, but in some cases have stopped originating loans.

In the case of my company, which is home based in the Southeast, primarily, we suffered losses of $2.4 million compared to $360,000 in 1985. MBA supports the implementation under the Gramm-Rudman-Hollings Act. No credit budget limits are mandated for secondary guarantees, such as the FNMA–MBS program, because the controlling limitations are on the primary credit programs, in this case, the underlying FHA and VA programs.

However, if this Congress nonetheless decides to impose a credit limit on GNMA, it should be high enough to accommodate anticipated demands of at least $150 billion for fiscal year 1988. GNMA has drawn down quickly on its $150 billion credit limit for fiscal year 1988, and more recent data through 1987 indicate that GNMA has only $70 billion in remaining issuing authority. While the situation is not yet critical, we do know this amount may not be sufficient to carry the agency through the end of the current fiscal year.

In summary, MBA urges the subcommittee and the Congress to adopt adequate credit limitations for FHA and GNMA credit programs and to recognize realistic activity levels for the VA program so the American dream of homeownership does not fade.

Many of these borrowers are purchasing their first homes because of the opportunities that the FHA and the VA programs offer. Others are moderate- to middle-income families who rely on the FHA and VA programs to assure a stable, affordable supply of mortgage credit.

MBA appreciates the opportunity to testify before the committee, and we will be pleased to answer any questions. Thank you.

Senator PROXMIRE. Thank you, Mr. Abbott. Your timing is exquisite.

[The statement follows:]

STATEMENT OF JAMES A. ABBOTT, CMB, PRESIDENT AND CHIEF EXECUTIVE OFFICER, FIRST UNION MORTGAGE CORP.

Mr. Chairman and members of the Subcommittee, my name is James A. Abbott, CMB. I am President and Chief Executive Officer of First Union Mortgage Corporation of Charlotte, North Carolina, and a member of the Legislative Committee of the Mortgage Bankers Association of America. Accompanying me today are Burton C. Wood, MBA's Legislative Counsel, and Linda K. Bumbalo, MBA's Associate Legislative Counsel.

We appreciate the opportunity to appear before you today to testify on the appropriations for FY 1988 for the Department of Housing and Urban Development (HUD) and for the Veterans Administration (VA). Our comments will focus on the necessity of establishing a sufficiently high credit budget limit for the non-subsidized, user-fee supported Federal Housing Administration (FHA) mortgage insurance program and a sufficiently high guaranty authority for the Government National Mortgage Association (GNMA) mortgage-backed security (MBS) program. We will also discuss the VA entitlement-based home loan guaranty program. Because the demand for home mortgage credit is interest rate sensitive, the performance of the economy in FY 1988 and Congress' ability to reduce the Federal deficit are relevant to the discussion of credit ceilings for FHA insurance and GNMA guaranties.

OVERVIEW OF CURRENT HOUSING MARKET ACTIVITIES

In 1986, mortgage interest rates declined to single digits for the first time in eight years, unleashing pent-up demand which resulted in unprecedented mortgage originations of $442 billion. Interest rates have been more volatile recently. With the recent uncertainty in the bond market, it is difficult to predict at what level mortgage interest rates will be for the remainder of 1987. We are hopeful that they will stabilize in the 10 to 10.5 percent area and perhaps at an even lower level. Because of these projected less favorable interest rates, demand for mortgage credit is expected to moderate in 1987 and through 1988. Single family starts, expected to be about 1.2 million, and a healthy, but not buoyant, existing home sales market and a slower demand for refinancing, should result in a total dollar volume of single family mortgage originations of about $350 billion to $375 billion in 1987. Single family mortgage originations are expected to stay in about the same range in 1988, reaching $330 billion to $360 billion.

With the current volatility and unpredictability of interest rates, there is the continual threat that FHA and GNMA credit ceilings will be inadequate to meet demand. These credit ceilings create a dilemma because they act as constraints on programs that are driven by consumer demand. MBA has consistently maintained that credit limitations on the FHA mortgage insurance and GNMA-MBS programs are unnecessary. Both programs are fully supported by user fees and, in fact, generate net revenues for the Federal government. However, in the event Congress decides to continue to place limits on these programs, MBA recommends that the credit ceilings for FY 1988 be set at least at $100 billion for FHA and $150 billion for GNMA. In the event they are not, we respectfully urge the Subcommittee and Congress to move expeditiously, as you have in the past, to establish adequate ceilings.

MBA continues to be deeply concerned about the Administration's repeated attempts to increase the fees homebuyers pay in order to use Federal housing finance programs. Both houses of Congress are acting to reject these proposed user fees, and for that, MBA is grateful. S 825, the "Housing and Community Development Act of 1987," passed by the Senate on March 31, 1987, and HR 4, the "Housing and Community Development Act of 1987," pending before the House Banking Committee, both contain strong language prohibiting increases in these fees except under very restrictive conditions. With respect to the March 1 increase in the GNMA fee, we were pleased that Congress acted with the speedy passage of PL 100-14 in March, prohibiting the fee increase.

In its FY 1988 budget proposal, the Administration called for increased fees on the FHA home mortgage insurance and the VA guaranty programs. MBA strongly opposes the imposition of these additional user taxes because the purpose of these fees is not for program use, but to generate net income for the U.S. Treasury. MBA strongly supports efforts to reduce the deficit. To this end, we have supported spending cuts wherever possible, stressing that all programs, including Social Security, defense, and cost of living adjustments (COLAs), should bear a fair share of necessary cuts. If these are not sufficient to accomplish deficit reduction, Congress should be prepared to increase taxes, but such increases should be broad-based and not focused on any one sector of the economy.

FEDERAL HOUSING ADMINISTRATION

Credit Ceilings

MBA urges the adoption of an FHA credit ceiling of at least $100 billion for FY 1988. The Administration has proposed a ceiling of $70 billion. Actual activity in FY 1986 totalled $102.6 billion. For the first six months of FY 1987, FHA activity was approximately $50 billion. If this pace of FHA volume continues or increases through the remainder of the year, it could well result in the $100 billion credit ceiling for FY 1987 being approached by the late summer. In a recent speech, Assistant Secretary for Housing-FHA Commissioner Thomas B. Demery indicated that he thought the FY 1987 ceiling could prove to be inadequate and that he was prepared to move promptly in requesting additional ceiling authority from Congress if necessary. This activity needs to be carefully monitored.

MBA projects that FHA programs will experience steady consumer demand in FY 1988 for several reasons. First, interest rates will hopefully remain at the present levels in the 10 percent to 10.5 percent range, resulting in continued homebuying demand. While at these levels, refinancing demand by borrowers could be expected to slacken, a downturn in rates to below 10 percent could rapidly refuel refinancing demand. In addition, the Federal National Mortgage Association (FNMA), the Federal Home Loan Mortgage Corporation (FHLMC), and private mortgage insurers have tightened their underwriting guidelines, which has resulted in more consumer demand for the FHA product. In several states experiencing regional economic downturns, private mortgage insurers have drastically reduced and in certain areas completely curtailed their insuring activity. In those areas, FHA is "the only game in town." FHA has always served the riskier borrower population, but because it carries a higher mortgage insurance premium it has, nonetheless, been actuarially sound.

Second, there is a legislative proposal that, if enacted into law, would increase FHA activity. Both the Senate and House housing bills would increase the maximum mortgage amount that FHA could insure to reflect increased housing costs. The loan size limit for designated high-cost housing areas would be increased to 150 percent of the base amount of $67,500, or up to $101,250. Currently, the maximum insurable mortgage amount in high cost areas is $90,000. This proposal, if enacted, can be expected to increase the dollar volume of FHA loans originated by approximately $4 billion in the current economic environment. This represents an increase of roughly 8 percent over the FHA volume projected under present limits.

Third, if interest rates increase to levels higher than projected, FHA activity could continue at the expected pace if FHA's authority to insure adjustable rate mortgages (ARMs) is increased.

Both the Senate and the House housing bills would increase the volume of adjustable rate mortgages (ARMs) that FHA would be authorized to insure from the present cap of 10 percent of the previous year's total FHA originations. S 825 would increase the FHA ARM origination cap to 40 percent and the House housing bill, HR 4, would increase the cap to 20 percent.

While borrowers have demonstrated a preference for fixed rate mortgages when interest rates are low, ARMs become the choice when mortgage rates increase. Thus, if interest rates move into the 11 percent and above range, many borrowers would stay in the market, choosing ARMs as their mortgage finance option.

FHA Staffing

Another area of concern is the inadequacy of current FHA staffing levels. The current high volume of loan activity is placing tremendous pressures on FHA's staff, which is now operating at less than full capacity due to vacancies that are not being filled. While Congress responded last year and gave HUD staffing assistance, its impact was mitigated by the noncompetitive salary structure of the Federal government in the loan origination area. Specifically, a private appraiser can easily make three times the pay level available in the Federal government.

Not only are all administrative costs including salaries for the homeownership programs covered by user-paid premiums, but, further, lenders have already assumed a large portion of FHA's processing tasks. Approximately 85 percent of FHA's loan volume is currently being processed by direct endorsement lenders. Therefore, FHA's function is to provide processing for a small percentage of cases and to review and audit closed loans. However, should further staff cuts be implemented in addition to Gramm-Rudman sequestration cuts in administrative costs, FHA's function of reviewing loan cases to determine whether FHA requirements are being satisfied would be seriously jeopardized. Such staff reductions would prove to be particularly detrimental to the FHA program during high volume cycles such as the current one.

In addition, Section 406 of HR 4 sets up staff-intensive loan review requirements to be implemented by HUD. MBA urges appropriations for increased staffing levels to accommodate these additional staff review functions that would ultimately benefit the program by curbing potential fraud and abuse.

VETERANS ADMINISTRATION

Since its inception, the VA home loan guaranty program has been an entitlement program to enable the men and women who have served this nation in the armed services become homeowners. It was never structured to be actuarially sound and supported by user fees. Because any veteran who qualifies for a guaranteed loan is entitled to one, the program has not been subject to appropriated credit authority ceilings.

However, with the enactment of the "Balanced Budget and Deficit Control Act of 1985" (PL 99-177), the Gramm-Rudman-Hollings Act, the parameters of the budget process, as it affects the smooth operation of the VA home loan guaranty program, are not as clear as they have been in the past. The status of the VA home loan guaranty program should be clarified. Under Section 8 of S 9, the "Service-Disabled Veterans Improvement Act of 1987," introduced by Senator Alan Cranston on January 6, 1987, benefits under this program would be specifically exempted from any sequestration order, or sequestration law enacted, for any fiscal year after FY 1986. MBA strongly supports this proposal and urges that Congress enact it into law.

If Congress does not exempt the VA guaranty entitlement program and sequestration does take place, all loan guaranty programs, including those not ordinarily subject to appropriated credit budget ceilings, will be subject to across-the-board cuts. If a program, such as the VA, has no established appropriation ceiling, a limit is established in the sequestration report and the across-the-board cut is made on that limit. For FY 1988 MBA believes an estimated level of activity of at least $40 billion is appropriate for the VA home loan program.

MBA believes that the VA home loan guaranty program is insufficiently staffed as evidenced by delays in loan processing and the review of appraisal reports, as well as delays in processing foreclosures of loans. In some instances, these foreclosure delays have resulted in no-bids, which have a severe impact on mortgage lenders who participate in the VA program. Because of these delays, interest accrual during this period increases a veteran's indebtedness to the point where the VA, in accordance with the claim payment formula in 38 USC 1816(c) enacted under the "Deficit Reduction Act of 1984" (PL 98-369), pays the lender only the guaranty amount and leaves the lender with the property that in most cases has depreciated in value.

As a result of regional economic problems and inadequate VA staff, lenders suffered losses of $86 million in 1986 and are being forced to make business decisions to deal with this shift in risk that will result in mortgage credit being more difficult or impossible for veterans to obtain. In certain economically depressed areas of the country, such as the Southwest, lenders have not only tightened their underwriting criteria, but in some cases have stopped originating loans.

The Administration's FY 1988 budget proposal states that an appropriation of $390 million will be needed to fund program operations. No appropriations were made in FY 1987. The $390 million will be required to operate the home loan guaranty program as an entitlement program for veterans of America's armed forces. The Administration's budget proposal also calls for increasing the funding fee paid by veterans from 1 percent to 2.5 percent, effective June 1, 1987. Such fee increases have been consistently rejected by Congress.

GOVERNMENT NATIONAL MORTGAGE ASSOCIATION

The Government National Mortgage Association mortgage-backed security (GNMA-MBS) program provides a means for homebuyers, primarily moderate- to middle-income families and veterans, to obtain competitive direct access to the capital markets via the secondary mortgage market. Because the GNMA-MBS is a secondary guaranty program, restrictive limitations on the GNMA-MBS program would limit program activity in the underlying FHA and VA primary loan programs.

In FY 1986, commitments issued in the GNMA-MBS program totalled $138 billion. MBA anticipates expanded use of the GNMA-MBS program in future years, due to its widespread acceptance in the marketplace and its critical value as a role model in fostering capital market innovations. Further, the level of purchases of VA and FHA loans by FNMA, relative to its conventional mortgage purchases, has declined in recent years because the yields required by FNMA have been more than yields prevailing in the GNMA market. As a result, the GNMA-MBS has become the most important conduit for tapping private funds for investments in FHA and VA loans. Approximately 95 percent of the FHA and VA loans originated are pooled in GNMA securities.

In FY 1987, GNMA program use is estimated, in the Administration's budget, to total at least $132.5 billion. For FY 1987, GNMA is subject to a credit budget limit of $150 billion.

Under the Gramm-Rudmann-Hollings budget procedure reforms, no credit budget limits are mandated for secondary guarantees, such as the GNMA-MBS program, because the controlling limitations are on the primary credit programs—in this case, the underlying FHA and VA programs. MBA supports this interpretation. However, if Congress nonetheless decides to impose a credit limit on GNMA, it should be high enough to accommodate anticipated demand—at least $150 billion for FY 1988.

The $150 billion limit imposed for FY 1987 appears to be adequate at this time. During the first six months of FY 1987 (October 1986 through the end of March 1987), GNMA issued slightly over $70.0 billion of commitments to guarantee mortgage-backed securities. This six-month total was a 41 percent increase from the $49.5 billion of commitments issued during the comparable period a year ago. During the same period, GNMA actually guaranteed $63.0 billion of mortgage-backed securities, or double the $30.9 billion of securities guaranteed during the comparable period last year.

Although GNMA has drawn down quickly on its $150 billion credit ceiling for FY 1987, GNMA officials are not overly concerned about a repeat of last year when the agency exhausted its credit authorization. We tend to share this belief, at least, based on the experience of the past six months. According to GNMA data, there was approximately $66.0 billion of commitments outstanding at the end of March. Together with the $80.0 billion of authority GNMA has remaining to issue, the outstanding stock should be sufficient to carry the agency through the end of the current fiscal year.

The situation, however, does merit careful, ongoing scrutiny. The recent jump of interest rates in the credit markets has sparked a new surge of loan applications from homebuyers who are fearful that rates will continue rising. This could increase demand for GNMA commitments among lenders who themselves may be fearful that the agency will run out before the end of September. However, as stated earlier in this testimony, MBA is appreciative of this Subcommittee's demonstrated willingness to increase this authority when necessary.

CONCLUSION

There is an immediate need for a viable, well-thought-out national housing policy. The framework of such a policy should provide for decent, safe, and sanitary housing at affordable prices for all Americans. In addition, housing policy should facilitate the steady flow of mortgage credit at reasonable rates of interest. The FHA, VA, and GNMA programs provide a remarkably simple and efficient engine for generating capital for housing, especially for moderately priced housing geared toward moderate-income families. These programs provide a perfect mix of private-government involvement in that they rely to a maximum extent on private lenders to make, market, and service loans and make credit markets more efficient; furthermore, the FHA and GNMA-MBS programs require no subsidy—in fact, they make money for the government.

In summary, MBA urges this Committee and the Congress to adopt adequate credit limitations for FHA and GNMA programs and to recognize realistic activity levels for the VA program so that the American dream of homeownership does not fade. Many of these borrowers are purchasing their first homes because of the opportunities that the FHA and VA programs offer. Others are moderate- and middle-income families who rely on the FHA and VA programs to assure a stable, affordable supply of mortgage credit.

MBA appreciates the opportunity to testify before this Subcommittee and would be happy to answer questions or provide additional information, as necessary, for inclusion in the hearing record.

STATEMENT OF RICHARD MAPP, VICE PRESIDENT, NATIONAL CAUCUS AND CENTER ON BLACK AGED

Senator PROXMIRE. While you folks were testifying, I wanted to have Mr. Richard Mapp come to the table if he has entered the room. Why don't you come forward and make your statement, and then I have a question for one or two of the other witnesses. Pull up that chair there.

Mr. Mapp, you represent the National Caucus and Center on the Black Aged?

Mr. MAPP. Yes, Senator Proxmire.

Senator PROXMIRE. Go right ahead, sir. You have 4 minutes.

Mr. MAPP. Chairman Proxmire, the National Caucus and Center on Black Aged [NCBA] appreciates the opportunity to testify at this hearing. As the only national aging organization focusing exclusively on the needs of older blacks, NCBA will concentrate primarily on the appropriations issues that affect elderly blacks.

Our testimony will focus on certain HUD housing programs and the Senior Environmental Employment Program.

In accordance with the subcommittee guidelines, I will summarize our major points and request that our full statement be submitted for the record.

Senator PROXMIRE. Without objection, that will be done.

HOUSING CONDITIONS

Mr. MAPP. Thank you. With regard to housing conditions, our nation has long articulated a goal of decent and affordable housing for all Americans since the congressional passage of the Housing Act of 1949.

Housing is perhaps the most visible sign of deprivation, especially among older blacks. This point was made emphatically clear at forums which NCBA conducted throughout our nation last year. Today, thousands of older blacks live in ramshackle, deteriorating, or unfit housing.

Many find themselves in an impossible housing situation. The homes may be old, crumbling, or deteriorating, but yet they lack the financial resources or skills to repair their dwellings to make them more habitable.

With regard to the section 202 program at HUD, NCBA supports sufficient funding with regard to section 202 direct loan programs, together with the requisite section 8 assistance to finance the construction or substantial rehab of at least 12,000 units. This is the same level that the Congress approved for fiscal year 1987.

If sufficient flexibility exists, NCBA would urge the subcommittee to approve financing for more section 202 units because a need certainly exists for additional housing for the elderly.

We are recommending this preservation level as a bare minimum because of the present budgetary constraints facing your subcommittee.

MINORITY SPONSORSHIP OF SECTION 202 PROGRAMS

We also call upon the subcommittee to include report language to encourage the Department of Housing and Urban Development to continue its efforts to promote more minority sponsorship of section 202 projects. Prior report language and earlier HUD appropriations acts have produced positive results. We are recommending followup report language to assure that these encouraging developments do not come to an abrupt halt.

With regard to public housing and section 8, several witnesses at the forums that we held last year provided compelling testimony about the gravity of the housing problems for older blacks. We have heard from a good cross-section of housing experts, including respected professionals such as ex-Secretary of HUD Robert Weaver, elderly tennants, housing managers, and others.

PRESEQUESTRATION FUNDING LEVELS SOUGHT

We recommend, therefore, Mr. Chairman, that the subcommittee approve as a bare minimum sufficient funding to maintain public housing and section 8 existing and mod rehab at their presequestration levels for fiscal year 1986.

This translates to approximately 5,000 public housing; 10,000 section 8 mod rehab units; and 32,000 section 8 existing units. If sufficient flexibility exists, again, we propose that funding for these housing programs for the poor be boosted, especially the public housing. About two out of every five households living in public housing is headed by an aged person.

With regard to congregate housing services, we also support full funding for this program. We believe that this activity should be a cornerstone in our nation's housing and services strategy to improve the quality of life for at-risk persons who may wind up in a nursing home at a significantly higher public expense.

Last, Mr. Chairman, we urge the subcommittee to include report language, again, calling upon the Environmental Protection Agency to make greater use of older workers in the Senior Environmental Employment Program. This is a clear example of a win-win situation for our nation and the older workers. Our nation benefits from the services performed by these enrollees, because they improve our environment, and we hope that you will keep this in mind, Mr. Chairman.

We want to thank you so much. The red light is on, and we appreciate the opportunity.

Senator PROXMIRE. Thank you, Mr. Mapp, very much.

[The statement follows:]

STATEMENT OF SAMUEL J. SIMMONS, PRESIDENT, NATIONAL CAUCUS AND CENTER ON BLACK AGED, INC.

Mr. Chairman and Members of the Subcommittee, the National Caucus and Center on Black Aged (NCBA) appreciates the opportunity to testify at this hearing. As the only national aging organization focusing exclusively on the needs of older Blacks, NCBA will concentrate primarily on appropriations issues that affect elderly Blacks.

Our testimony will focus on funding housing programs serving older Blacks and the Senior Environmental Employment (SEE) Program.

A. Housing Conditions for Aged Blacks

Our nation has long articulated a goal of decent and affordable housing for all Americans. However, older Americans continue to be among the most poorly housed groups in our society today, especially elderly Blacks and other low-income aged minorities.

An estimated 20 percent of aged-headed households reside in inadequate or substandard housing. For most older Americans, housing is the number one expenditure. Today, many elderly persons spend at least one-third of their income for shelter, and a significant percentage spend substantially more--especially low-income aged persons who are unable to live in federally-assisted housing. In fact, almost one-half of the elderly poor spend 45 percent or more of their meager income for shelter.

Housing is perhaps the most visible sign of deprivation among older Blacks. This point was made emphatically at forums which NCBA conducted throughout our nation last year. Today, thousands of older Blacks live in ramshackle, deteriorating or unfit housing. Many find themselves in an impossible housing situation. Their homes may be old, crumbling or deteriorating. Yet, they lack the financial resources or skills to repair their dwellings to make them more habitable.

According to a 1981 Louis Harris poll commissioned for the National Council on Aging, one of out three older Blacks considered their housing to be unsuitable. For all older Americans, one out of eight persons 65 years of age or older said that housing was a serious problem.

B Section 202 Housing for the Elderly and Handicapped

Long waiting lists now exist for much federally-assisted housing. A striking example is the section 202 housing for the elderly and handicapped program. Waiting lists have averaged about 13 months in length.

This represents just the tip of the iceberg, though. About one out of every four applicants must wait five years or longer before a section 202 apartment becomes available. Recently, more than a quarter of a million older Americans were on section 202 waiting lists. However, only about 21 percent of the elderly applying for section 202 housing will, on the average, move into the units that they have sought.

NCBA supports sufficient lending authority for the section 202 direct loan program, together with the requisite section 8 assistance, to finance the construction or substantial rehabilitation of at least 12,000 units. This is the same level that the Congress approved for fiscal year 1987. If sufficient flexibility exists, NCBA would urge the Subcommittee to approve financing for more section 202 housing units because a need certainly exists for additional housing for the elderly.

In fiscal year 1980, there were 20,850 housing starts under the section 202 program. Our nation was not responding fully to the need for section 202 housing then. The situation has intensified now because of sharp reductions in federally-assisted housing programs, including section 202, since 1980.

Over the years, section 202 housing has clearly demonstrated its value and worth for our nation. Section 202 has provided quality and affordable housing that is ideally suited for older Americans. NCBA wants to emphasize again that the need for section 202 housing is clearly greater than the 12,000 units that we have proposed. However, we are recommending this reservation level, as a bare minimum, because of the present budget constraints facing the Subcommittee.

We also call upon the Subcommittee to include report language to encourage the Department of Housing and Urban Development to continue its efforts to promote more minority sponsorship of section 202 projects. Prior report language in earlier HUD-Independent Agencies Appropriations Acts has produced positive results. We are recommending follow-up report language to assure that these encouraging developments do not come to an abrupt halt.

C. Public Housing and Section 8

Witnesses at the NCBA forums last year provided much compelling testimony about the gravity of the housing problems for older Blacks. We heard from a good cross section of housing experts, including respected professionals, such as former Housing and Urban Development Secretary Robert C. Weaver, elderly tenants, housing managers, and others.

The message, though--whether it came from the professionals or the elderly--was the same: A housing crisis already exists for older Blacks. It will quite likely deteriorate in the years ahead unless policy changes are made.

A great need exists for additional housing for aged Blacks and other low-income older Americans. However, only 13 percent of all elderly poor persons--one out of every seven aged persons with incomes below the poverty line--resided in federally-assisted housing in 1984

NCBA recommends that the Subcommittee approve, as a bare minimum, sufficient funding to maintain public housing and section 8 existing and moderate rehabilitation at their pre-sequestration levels for fiscal year 1986. This translates to approximately 5,000 public housing units, 10,000 section 8 moderate rehabilitation units, and 32,000 section 8 existing units.

The need is clearly greater than NCBA's proposed funding level. However, we are making this modest recommendation because of budgetary contraints. If sufficient flexibility exists, we would propose that funding for these crucial housing programs for the poor be boosted, especially for public housing. About two out of every five households living in public housing is headed by an aged person.

D. Congregate Housing Services

NCBA also supports full funding for the congregate housing services program. We believe that this activity should be a cornerstone in our nation's housing and services strategy to improve the quality of life for "at risk" persons who may wind up in a nursing home at a significantly higher public expense.

Today, many older Americans are unnecessarily or prematurely institutionalized. Congregate housing services, though, can enable "at-risk" persons to live independently. Some experts project that 15 to 40 percent of all nursing home residents do not need full institutional care, but simply require basic social and other related services, such as meals, housekeeping or personal care assistance.

Congregate housing services are not only humane but also make sense economically for our nation and older persons. The record is clear that the congregate housing services program pays a handsome dividend by preventing unnecessary or premature institutionalization.

E. Senior Environmental Employment (SEE) Program

Lastly, NCBA urges the Subcomittee to include report language again calling upon the Environmental Protection Agency to make greater use of older workers in the Senior Environmental Employment (SEE) program. This is a clear example of a "win-win" situation for our nation and the older wokers.

Our nation benefits from the services performed by SEE enrollees who improve our environment. These activities take many forms, including the school asbestos abatement program, improving he quality of the air that we breathe, and many others.

Older workers benefit, too, from SEE in numerous ways. They earn money to help meet their financial and other obligations. But perhaps most importantly, they provide valuable services by assisting others in their communities.

F. Conclusion

In conclusion, we wish to thank you again for this opportunity to present our views. Over the years, this Subcommittee has responded to the housing and other needs of low-income older Americans. You have been fair and fiscally responsible. We urge your continued support.

If you wish, we shall be glad to respond to any questions that the Subcommittee may have either directly or through a written response. Thank you.

ASSISTED HOUSING BUDGET

Senator Proxmire. Mr. Adams, your organization is recommending an assisted housing budget large enough to provide for 60,000 existing section 8 units, 20,000 section 8 moderate rehabilitation units, and 20,000 new conventional public housing units.

Can you tell us how much this would cost in fiscal year 1988 budget authority? I asked the question because it would cost considerably more than we appropriated for fiscal year 1987, and yet the Senate-passed budget resolution assumes a freeze in assisted housing programs.

So that puts us in a spot. If we go to the floor and ask for this or go to the committee and ask for this, we will be in trouble for that reason.

Mr. Adams. I can get you the exact cost. I think we realize it is over budget. What we wanted to do was identify a very modest need. The need is even greater than we recommended, but at least to identify the need, recognizing that there are budget considerations that might prevent it from being achieved.

Senator Proxmire. I appreciate that. If you could, for the record, we very much would like to have whatever recommendations you have.

Mr. Adams. Fine.

Senator Proxmire. You can provide that.

PUBLIC HOUSING OPERATING SUBSIDIES

Mr. Cavanaugh, your organization is requesting $1.7 billion for public housing operating subsidies in fiscal year 1988. On the other hand, the House and Senate-passed budget resolutions assume a budget of $1.6 billion for the program next year.

Can you tell us where we might come up with the extra $100 million we need to implement your recommendation, keeping in mind we have to find an offset within the programs funded by this subcommittee? That includes not only housing, but the Environmental Protection Agency, the National Science Foundation, the Veterans Administration, and NASA.

Mr. Cavanaugh. I don't think I would presume to suggest a policy to call on that, but if I am not mistaken, the total appropriations of the subcommittee are about $55 billion, and not much of that are discretionary programs, things that have not been started, but you will fund to start, whereas the operating subsidies is virtually an entitlement program in that we can only operate the program with those funds.

The CBO figure, unfortunately, which is reflected in the budget resolution, got caught in the trap that HUD set for it, and that is that HUD has denied, has refused to change the PFS for 3 straight years, despite your committee's instructions to do so, and in each of those 3 years, we have lost $100 or more millions of dollars.

Incidentally, HUD concedes recently that the shortfall between the insurance cost and the PFS and what we are actually paying exceeds $150 million. I guess I would say simply, if you took the CBO baseline figure which they use from the PFS system and you added what HUD shortchanged the PFS system, it would come out to the $1.7 billion that we have recommended.

Senator PROXMIRE. We have to work, you see, within very tough limits. As I indicated, by listing these programs, they are all very popular programs with a lot of support. The administration is asking for a very big increase in funding for the National Science Foundation and for the Space Agency. They are popular programs. What we need, really, is to get some steam behind cutting these other programs so we can provide a fairer, more equitable distribution of the funds available.

Mr. CAVANAUGH. If I may, I would just say that the conservative approach is to take care of what we have got, and what we have is 1.3 million public housing units, and before we start anything new or launch any activities that aren't yet launched—I am not suggesting a particular budget with the use of that word. [Laughter.]

Mr. CAVANAUGH [continuing]. That we take care of public housing. The committee has honored that principle, I think, and I hope it will do it again.

Senator PROXMIRE. Thank you, very, very much. Thank you folks very much for your time.

STATEMENT OF JOHN SIMON, PRESIDENT, NATIONAL HOUSING CONFERENCE

Senator PROXMIRE. I understand that John Simon has entered the room. We will be happy to have Mr. Simon come forward.

Mr. Simon, you are going to be joined at the table with David Draper, who is here.

Is Mr. Draper here?

Come right forward, Mr. Draper, who represents the American Institute of Architects; Mr. Richard Drnevich, representing the Redevelopment Authority of Allegheny County; Mr. Lawrence Swanson, president of the Pennsylvania Low-Income Housing Coalition; and Mr. Robert Ploehn.

Is Mr. Ploehn here?

Come forward, sir. He is executive director of the Erie County Industrial Development Corp.

Mr. Simon, we have waited a long time for you. You go right ahead, sir. You have 4 minutes.

Mr. SIMON. My name is John Simon. I am the president of the National Housing Conference, which is the oldest housing organization in the country, pushing toward affordable housing for all Americans. I would like to apologize to you for being late but the Continental shuttle from New York took 3 hours and 10 minutes today. I am glad to see that the Congress has done something about those flight delays. I would like to tell you that my last night back on Tuesday took 2 hours and 45 minutes.

Senator PROXMIRE. Try Amtrak.

Mr. SIMON. That is the answer, sir.

We have prepared written testimony, and that has been submitted, and I don't think it is worthwhile for me to read it. I am sure you will take time to look at it.

Senator PROXMIRE. We will put it in full in the record. We certainly will review it.

Mr. SIMON. I know that this is a tough assignment that you have, because the monies that are available are limited, and everybody is asking for more. I heard the last speaker say that perhaps our first concentration should be on keeping that which we have, and I agree with that. But you also realize that housing and low-income and moderate-income housing, in particular, has taken a greater cut in the last few years in the budget than almost any other program.

INADEQUATE SUPPLY OF HOUSING

While we are not really asking for more, we are pleading with you not to make any further cuts. The housing situation in the country is bad. In some areas, I must say that there is an adequate supply of housing, although it is not affordable to everybody, but in many parts of the country, there simply is not an adequate supply of housing and certainly not an adequate supply of affordable housing.

The National Housing Conference has chapters in many states and cities, and we find the same report everywhere. People are either house poor or have no housing or live in substandard housing. I, for one, live in New York City where the waiting list for public housing is now at 21 years, and that is an unconscionable long time for anyone to obtain housing.

I would like to say to you that the National Housing Conference has been very active and very effective, I think, in trying to get states and cities to do their own part and to make monies available for housing. New York, Massachusetts, Maryland, California, and Michigan have done just that.

But without the assistance of the federal government, without money for the various programs that I have outlined in my report, it will never provide sufficient housing for most families in this country who need it.

I would also like to say, parenthetically, that you can have fair housing, and I know you have been concerned, Mr. Chairman, with fair housing. You can't have fair housing unless you have a supply of affordable housing. As long as affordable and adequate housing is limited, there will be two tiers in this country, and we simply will not have the kind of fair housing which is necessary to house all Americans on an equal basis.

APPROACHING CRISIS

I would like to say also that as you might be aware, the future is coming. The prepayment issue of the 236, the 235, the 221(d)(3)'s are all approaching a crisis. Soon, large amounts of money, I believe, will have to be made available to take care of these programs, which, on the one hand, will have to protect the contractual rights of the owners; on the other hand, the tenants' rights, the rights of the people living there, who will not be able to afford fair market rents.

We urge you that in this budget year, at least, you maintain that which we have for the various programs that we are concerned about;

certainly, public housing, certainly, public housing modernization, where HUD's own study says the requirement for updating the public housing program is around $234 billion.

Please preserve community development block grants at the present level, at least. With revenue sharing out of the way, that is about the last safety belt many localities have. I think the UDAG program has provided jobs and has been helpful. I think some additional public housing should be provided in view of the housing shortage, and certainly, we believe that no fees should be increased in FNMA or GNMA and VA programs to further increase the cost of housing.

We are pleading with you: Let us keep what we have and then work toward the future. Thank you.

Senator PROXMIRE. Thank you very much, Mr. Simon.

[The statement follows:]

STATEMENT OF JOHN SIMON, PRESIDENT, NATIONAL HOUSING CONFERENCE

Mr. Chairman and Members of the Subcommittee, my name is John Simon. I am President of the National Housing Conference and I appreciate this opportunity to present the views of the National Housing Conference on HUD Appropriations for FY 1988.

Last year, I indicated in my statement to the Subcommittee how similar the situation then was to the year before that. The Administration had proposed in its HUD budget for 1987, essentially, a cessation of any significant, continued support for low and moderate income housing, as well as sharp reductions or the complete termination of the CDBG and related programs. That was what it had asked for in FY 1986 and had had rejected.

Again this year, the situation is not much different from last year and the year before. The Administration would eliminate the Public Housing Program; the Housing Development Grant Program; the 202 Housing Program for the Elderly, except for a deferral disguished as a carry-over; all Section 8 assistance except for vouchers; Urban Development Action Grants; 312 Rehabilitation Loans; and several other miscellaneous programs. Along with these 1988 proposals, over one billion dollars in FY 1987 budget authority rescissions were proposed. If there is any real difference from last year, it is that deferrals are no longer proposed, just postponements or carryovers, and the intended demise of the 202 and 312 loan programs would be celebrated by starting the sell-off of their loan portfolios at substantial discounts.

As we did last year and the previous year, we urge you to reject once again these Administration budget proposals, for both FY 1987 and FY 1988. You, better than we, know how harmful their adoption would be to the ongoing ability of HUD to function and to meet appropriately its responsibility of helping, in a meaningful fashion, to house those who cannot afford to obtain decent housing on their own.

We urge that, at a minimum, you approve FY 1988 funding levels for the various HUD programs consistent with those approved last year. Wherever possible, we urge you to expand those program levels, in order that the significant shortfalls in assisted housing and community development aid that have occurred over the past several years can begin to be made up. We realize that this is a difficult task in light of the severe budgetary constraints confronting you, but the needs are substantial and the problems will not go away.

We have addressed these needs, and the program level expansions required to meet them, in the Policy Statement adopted at our Annual Meeting in March. We urge you to review that statement, a copy of which is attached, and implement wherever possible the funding levels it calls for. Set out below are some of our principal recommendations:

° The Public Housing Program should be continued at a level of 20,000 units. Modernization should be funded at a minimum level of $1.5 billion and adequate operating subsidies should continue to be appropriated.

- The Community Development Block Grant Program should be funded at a minimum level of $3.5 billion, with the Section 108 loan guarantee program continued at a $150 million level.
- The UDAG Program should be continued at a $300 million funding level. We also suggest that consideration be given to providing the Secretary an additional $25 million discretionary fund to deal with those unusual and unique problems that are not fundable under normal criteria.
- Sufficient funds should be provided to support at least 200,000 additional units of multifamily housing for low and moderate income families and the elderly and the handicapped, using a combination of the 202, Housing Development Grant, Rental Rehabilitation, Section 8 Moderate Rehabilitation, and Section 8 Certificate programs.
- Assistance for Section 8 vouchers, however, should only be provided at such minimal level as necessary to continue any ongoing experiments and commitments.
- We support 50,000 units of homeownership assistance, including the tried and proven 235 Program and new initiatives, such as the Nehemiah Program that has worked so successfully in New York.
- The 312 Rehabilitation Loan Program should be continued at least at the loan repayment level. The proposal to sell off the present loan portfolio at an estimated 10¢ on the dollar should be summarily rejected.
- Adequate guarantee levels should be provided for FHA, GNMA, and the Veterans Administration, to assure that these necessary programs are able to meet the demand.
- There should be no increase in the present user fees imposed under the various FHA, GNMA, and VA programs.
- Funds should be provided for sufficient staff to administer in a timely fashion HUD's many responsibilities.

We greatly appreciate the continued support that the Subcommittee and the full Appropriations Committee have given to maintaining HUD as a viable entity. Your refusal to go along with the gutting of its essential programs, as has been recommended year after year by the Administration, has been key to keeping alive the Federal Government's longstanding commitment to a decent home and suitable neighborhood for all of its citizens. We urge that you continue to recognize this commitment in your actions on HUD's FY 1988 budget.

LEGISLATIVE POLICY
# of the
NATIONAL HOUSING CONFERENCE

Adopted March 23, 1987

INTRODUCTION

NHC must take a strong leadership position in mobilizing a broad constituency for housing. It is an appropriate time, 50 years after public housing was first authorized by the United States Housing Act of 1937; it is needed as we observe the effects of a lost constituency around us; and above all it is our duty and it is right! The next year and a half offers NHC that opportunity as we move through a Presidential election process. So how can housing be made an integral part of that process?

To mobilize a broad constituency for housing both in Congress, State Legislatures and among the American people, the housing needs for those currently in need,or at risk of becoming in need, must be documented and made real. Only then will political leadership give and be given a receptive ear and be able to mobilize the powers that be and will be to a recommitment to meeting the housing rights and needs of all Americans.

Once these housing needs are recognized, a meaningful response to addressing them can be fashioned. A high priority should be the preservation and conservation of the existing assisted housing stock. This stock represents a substantial investment from years of expenditures and effort, an invaluable resource that with appropriate and adequate attention can continue to meet affordable housing needs in an economical manner. It is essential to conserve what already exists.

There are viable and effective production tools that can be pressed back into service with a renewed commitment. Added to those must be creative new tools that go beyond traditional configurations of government and private efforts, that forge linkages that work for all. As the needs vary from locale to locale, so must the tools to address those needs.

And, lastly, the nation's political leadership must forge the link between a rational fiscal policy and the social and economic good represented by the production and preservation of affordable housing for all Americans. Thus, NHC must be the moving force behind mobilizing a broad housing constituency.

The need for this constituency becomes very evident when the Administration's 1987 budget and legislative proposals for housing are examined. Once again, the Administration proposes to reduce significantly funding for low and moderate income housing programs and assistance for community and economic development; to terminate many long-standing and successful programs; to shift practically all future housing assistance into the voucher program; and to privatize as much of the Government support system for housing as it believes it might be able to get away with. NHC strongly opposes these Administration budget and legislative proposals and urges the Congress to set us out, once again, on the road to meeting that goal of the 1949 Housing Act of a decent home and a suitable living environment for every American family.

The following resolutions address themselves to specific policies and issues we believe need attention during the coming year.

PUBLIC HOUSING

o We support, for fiscal year 1988, an authorization and appropriation level of at least 20,000 additional units of public housing.

o We support full funding of the CIAP (modernization) program in FY 1988 at a level of at least $1.5 billion to assure the preservation of existing public housing stock and avoid the demolition of projects which can be rehabilitated. We, however, oppose the Administration's proposed shifting of $436.9 million of FY 1987 modernization funds to FY 1988. We support Public Housing comprehensive grant legislation which would create a stable system for carrying out on-going modernization efforts and would provide a replacement reserve system for future modernization needs.

o We support a level of operating subsidies under the Peformance Funding System that will permit housing authorities to maintain units properly and to provide adequate staff for the management of their projects. We believe $1.6 billion should be adequate for FY 1988. We also support changes in the Performance Funding System which will: recognize annual adjustments in the expense calculation necessary to meet unforeseen problems; encourage public housing authorities to develop sources of additional income; create an adequate (20% of annual expense budget) operating reserve level; and encourage local housing authorities to adopt a performance standards system.

o We urge enactment of legislation providing for the replacement, on a unit-for-unit basis, of any public housing projects permitted to be sold or demolished, unless it can be demonstrated that there is no longer a need for low-income housing in the community.

o We support the innovative efforts of local housing authorities to utilize their resources creatively in order to preserve and expand the supply of low income housing in their communities. These efforts reflect the concerns of many PHAs threatened by financial hardships, demolition of some of their present stock and political instability.

COMMUNITY DEVELOPMENT BLOCK GRANTS

o We are absolutely opposed to the Administration's proposed rescission of $375.2 million of Fiscal Year 1987 funding.

o We support a three-year reauthorization of the CDBG program at a minimum annual level of $3.5 billion, which merely represents a return to the funding level prevalent for the several years prior to FY 1986. There are an increased number of recipients, and the needs of our cities and urban counties continue to grow as their infrastructure ages. If they are to be able to improve areas which are physically and economically deteriorating, they must be able to plan on a stable source of income for those efforts which they cannot finance locally.

o In view of the fact that, at best, the CDBG program will continue at a sharply reduced rate in terms of real dollars, we oppose any efforts to broaden the types of activities which can be undertaken, changes in distribution formulas or creation of new categories of recipients, or the absorption by this program of other federal programs (e.g., EDA, FmHA, et al).

- The Section 108 Loan Guarantee program has proven to be a most valuable and cost effective tool for helping in local economic development and other CDBG efforts. We oppose the Administration's proposed termination of the program. We recommend a continuation of the annual loan authorization level of $150 million.

- We support the continuation of the Section 312 rehabilitation program and oppose the proposed sale of its loan portfolio and the transfer of its unobligated balances to the CDBG program. The program has operated for years through a recycling of funds received from repayment of existing loans. The sale of these loans at an estimated 10 cents on the dollar would destroy the ability to continue this cost-free means of sustaining this important program.

ECONOMIC DEVELOPMENT AND UDAG

- We support a broad range of programs that provide jobs, infrastructure improvements, community revitalization and economic development for the nation's urban and rural communities. This includes specific support for jobs legislation and the UDAG program, which must be continued. We adamantly oppose the proposed termination of the UDAG program and the rescission of $205.4 million in grant authority.

- The UDAG program has been most successful in promoting creative private-public partnerships which are helping economically distressed cities to attract private capital for economic development. There is currently a greater demand than there are funds for viable, important projects. These will not survive a long waiting period for funding. There is also a need to assure that projects from all eligible communities have a better chance of being funded than is now possible under present HUD criteria which give preeminent consideration to the extent a community is distressed. We, therefore, support UDAG funds being allocated partially on the basis of distress, impaction and project quality, and partially on the basis solely of project quality.

- We support a three-year reauthorization for UDAG at a minimum annual level of $300 million, and we suggest that consideration be given to an additional discretionary fund of $25 million which could be used by the Secretary to assist worthwhile, important projects which might not otherwise be funded due to aberrations in the statistics of the project selection system.

COOPERATIVE HOUSING

- We support tax reform for cooperative housing which would clarify that interest on reserves, patronage rebates, and payments to the cooperative under Section 8 and similar programs are member income. We also support tax reform which would provide the benefits of cooperative housing taxation to all cooperatives whose principal purpose is providing housing for its members.

- We request HUD to issue promptly workable regulations for FHA-insured share financing as provided in the 1983 Housing Act.

FAIR HOUSING; EQUAL OPPORTUNITY; AFFIRMATIVE ACTION

- We support legislation which would (1) extend the Fair Housing Act to protect the handicapped capable of independent living and families with children; (2) provide for strengthened enforcement by the appointment of administrative law judges to hear and adjudicatee housing discrimination complaints; and (3) clarify ambiguities in coverage to assure protection against all forms of discrimination by all elements of the housing and home finance industry.

- We support the proposed Fair Housing Initiatives Program, but we urge that rigid guidelines for the carrying out of testing not be set out in the legislation but rather be left to the more flexible approach possible under administrative regulations.

- We support any housing and housing-related progams which further the goals for racial and economic integration. The drastic reduction of funding for new production makes it most difficult for low and moderate income families and handicapped persons to broaden their geographic opportunities for finding decent housing that they can afford.

RURAL HOUSING; INDIAN AND NATIVE AMERICAN HOUSING

- We oppose the proposed termination of FmHA housing and development programs in FY 1988 and the proposed massive rescissions for these programs in FY 1987. The proposed partial replacement of these programs with Section 8 vouchers is an absolutely unworkable solution to the housing needs of rural America.

- We support continued full funding for FmHA's housing programs, including $3.4 billion for FY 1988 for FmHA's rural single family and rental programs which primarily service low-income families. We continue our support for a reasonable authorization level for rural rental assistance, the rural housing preservation program, the self-help housing program, and 504 repair grants for elderly homeowners.

- We support the continuation of existing housing programs for Indians and Native Americans and full funding of the infrastructure needed to support such housing. No housing should be constructed without adequate sanitary facilities.

- We support appropriation of sufficient funds to assure adequate staffing of the FmHA housing programs.

OTHER FEDERALLY ASSISTED HOUSING PROGRAMS

- We support a program of assistance during FY 1988 for not less than 200,000 additional units of multifamily housing for low and moderate income families, elderly and handicapped. We oppose the proposed termination of almost all forms of housing assistance except for vouchers. We also oppose the proposed rescission of Section 8 Moderate Rehabilitation, Housing Development Grant, and Rental Rehabilitation funds and the transfer of part of the FY 1987 202 program to FY 1988.

- The 200,000 units under the program recommended above should be allocated among the following HUD programs: public housing development; Section 202; Section 8 Moderate Rehabilitation housing; Indian development housing; HoDAG; Rental Rehabilitation and the Section 8 Certificate program. We urge that Congress direct HUD to study and report back on means by which some flexibility in the allocation of funds under those specific programs could be devised, so that there can be a better targeting of the type of housing assistance needed in each particular area. For example, in areas of the nation where existing rental housing is in short supply and there are virtually no vacancies at low-moderate rent levels, there would be an obvious need to target funding for new construction or substantial rehabilitation to those areas. Similarly, in the case of programs (e.g., Section 8 certificates) which rely on the existing housing stock, how best to target those types of funds to areas where there is a high vacancy rate in existing housing should be demonstrated.

- We continue our support for a program which would encourage private developer initiatives in the construction of housing for low-income families. This has historically been proven to be a most successful production tool. We believe that it is both possible and desirable to devise a program that combines private capital and initiative with public investment and which is realistic and equitable in terms of encouraging private sector participation and yet protects the public interest.

- We support legislation which would enable the successful Nehemiah Program in New York City to be undertaken elsewhere.

- We continue to oppose the Administration's efforts to replace, with a voucher program, the Existing and Moderate Rehabilitation Section 8 programs.

- We also oppose HUD's backdoor efforts to convert the Section 8 Existing program to a voucher program through a series of proposals that would apply to outstanding as well as new contracts for certificates. These proposals would force down artifically Section 8 rents and the annual adjustment of those rents; reduce administrative fees to local housing authorities managing the program; and impose several other changes which would remove present protections for the low-income users of certificates and otherwise limit the effectiveness of the program.

- We support the Section 235 program and urge that it be extended with a greatly increased authorization. The program has been a most important tool for the provision of homeownership opportunities for moderate-income families, and we urge an annual funding level of at least 50,000 units.

- We urge the Federal Government to commit to retain at least the current number of units of federally assisted housing now occupied by low and moderate income households. This includes all present public housing, HUD-assisted and HUD-held units, as well as units assisted by the Farmers Home Administration, where the problem is especially crucial and immediate. Where such units are, or have been, removed from the supply, they should be replaced. The necessary funds should be provided to maintain this housing in viable condition and to continue the low and moderate income character of projects acquired by HUD and subsequently sold by it.

- We support legislation which would broaden the scope of the Section 202 program and increase substantially the number of units assisted.

- We support legislation to remove the present statutory limitation, imposed in 1981, on the percentage of families with income between 50% and 80% of the median that can be admitted to Section 8 and public housing projects, and to restore to 25% the rent-income ratio applicable to tenants receiving public housing, Section 8, rent supplement, 236, and FmHA assistance. These steps, taken together, would improve the viability of these projects, foster increased economic integration and protect the public interest in the projects.

- The housing needs of the homeless have been the subject of great rhetoric and, up to now, little action. Previous legislative efforts have not resulted in a meaningful production approach. Legislation now moving through the Congress would at last provide for the undertaking of substantial efforts to both provide shelter and needed supportive services for America's homeless. While we support H.R. 558 and like legislation, it must be recognized that passage of such legislation will not relieve the need to provide permanent housing for the homeless.

- The low-income housing tax credit, authorized in the Tax Reform Act of 1986, holds some promise for partially making up for the removal from the Tax Code of other long-standing tax incentives for lower income housing and the sharp decline in recent years of other forms of Federal assistance for low and moderate income housing. This promise will only be realized, however, if the many problems in the credit's present statutory language are corrected. We urge quick action on these corrections.

MORTGAGE FUNDS

- We support the maintenance and strengthening of existing programs and activities that direct credit resources into the housing mortgage market, such as FHA mortgage insurance and GNMA mortgage-backed security programs, without arbitrary caps on their use. We support the development of new mechanisms to assure that an adequate amount of mortgage funds are available for housing.

- We reaffirm our long-standing support for FNMA and FHLMC as quasi-public, private corporations, dedicated to directing capital from the secondary markets into housing at reasonable rates. We oppose efforts to weaken these organizations by removing their governmental linkage or imposing so-called user charges.

- We oppose the proposed increases in the FHA mortgage insurance premium and in GNMA and VA user charges. It would appear that they have been suggested only as devices effectively to kill the programs. Similarly, we oppose any changes in the FHA programs which would restrict the eligibility of users or participants beyond those restrictions which are now in the statute.

- We oppose any arbitrary limitations on loan guarantee authority for the Veterans Administration housing program. The VA housing effort has been a most important tool for stimulating homeownership in many sections of our nation. Any additions to the housing supply in a tight housing market help to reduce the inflationary costs of housing and inevitably have a positive effect on housing availability at all levels of income and cost.

- We oppose proposed legislation to establish in the Treasury Department a Federal Credit Program Revolving Fund into which there would be required to be transferred all assets, liabilities, etc., of any Federal credit program, such as FHA, VA, GNMA, etc., and into which, before any direct or guaranteed Federal loan could be made, there would have to be paid by the appropriate agency, such as HUD, an amount equal to the "net present value of the subsidy cost" associated with the loan or guarantee "as determined by the Fund". Enactment of such legislation, requiring massive appropriations to cover theoretical subsidy costs, would sharply curtail, if not kill, the many Federal housing credit programs.

- We support the restoration of the Credit Control Act of 1969, on a standby basis, to permit use of selective credit regulation at such times as it may be needed in the future to bring about or maintain affordable interest rates.

HUD STAFFING

- Frequent expressions of opposition to both its mission and its programs have had a severely adverse impact on the morale of HUD staff. In many program areas, the staff level is woefully inadequate. Long delays in filling vacancies in subcabinet and other top supervisory positions have given the impression that the Department's role is unimportant. All of this has contributed to a significant decline in espirit de corps and productivity. We urge the Congress and the Secretary of HUD to recognize affirmatively the important role that HUD's staff plays in the success of its programs; to take such steps as are necessary to assure that the Department becomes an attractive place for professional and other workers to make a career; and to assure that the Department is staffed at a level adequate to administer effectively its many essential responsibilities.

STATEMENT OF DAVID W. DRAPER, AIA, ON BEHALF OF THE AMERICAN INSTITUTE OF ARCHITECTS

Senator PROXMIRE. Our next witness is David Draper, American Institute of Architects. Thank you.

Mr. DRAPER. Thank you. Mr. Chairman, members of the subcommittee, I am an architect with a practice in Silver Spring, Md. As a former president of the Maryland Society of Architects and one who has designed numerous HUD-sponsored projects, I am pleased to present the views of the AIA on housing and community development appropriations for 1988.

HOUSING AND COMMUNITY DEVELOPMENT

I would like to focus my remarks on two areas of concern: Housing and community development. The AIA is aware that Congress is unlikely to fund existing programs in these areas at levels higher than they currently exist because of the enormous federal deficit and that current levels of funding are not adequate to meet national needs.

But federal housing and community development programs have experienced disproportionate cutbacks compared to other domestic programs, and the consequences of the cutbacks are now being paid for, not only in the currency of human and social hardship, but in tax dollars because the byproducts of poor housing and neglected neighborhoods often are disease, joblessness and crime.

The AIA recognizes that the federal government cannot be the sole source of solutions for our nation's housing and community problems. It must be a partner and facilitator for local and state governments and for the private sector. For fiscal year 1988, the AIA supports funding at the current service levels for the community development block grant, the urban development action grant, the housing development action grant, and the rental rehabilitation programs, along with section 8 rehab and section 202 housing for the elderly and handicapped.

Current funding levels are significantly less than the federal government provided for housing and community development 6 years ago. CDBG has declined by one-third and UDAG by two-thirds. The HUD-assisted housing budget authority has dropped over 60 percent since 1980, while the numbers of newly constructed and substantially rehabilitated units have declined from almost 130,000 units to just 16,500.

As an architect who personally has designed more than 500 units of 202 housing for the elderly during the early 1980's, I have watched this program virtually die from funding starvation. Of the 23 million very low-income households, two-thirds of them live in substandard housing or pay excessive rent. As many as 5 million additional very low-income persons are expected to face serious housing developments by the end of this century.

Only one-fifth of those in need are reached by federal assistance today. Waiting lists for housing assistance stretch three years and even longer, as we just heard. New housing production for low-income persons has virtually halted, severely limiting housing availability for such people in the long run.

At the same time, rental rehabilitation frequently displaces tenants into markets that cannot absorb them, because little new affordable housing is entering the pipeline.

NEED FOR FEDERAL FUNDS

The solution to housing problems lies less in new programs and more in adequate funding or funding for the ones that exist. While it is clear that localities and states have their own obligations to contribute more resources to housing solutions, it is also clear that they will never fill the gap themselves.

Continued meaningful federal presence is both appropriate and necessary. We believe these programs successfully serve their purpose and do deserve continuation. CDGB is well-targeted, with the most distressed communities receiving more than three and one-half times the amount received by less distressed. Its flexibility to aid housing rehabilitation, infrastructure repair, neighborhood self-help programs, and homeless relief has made it an important difference in hundreds of communities over the past 12 years.

UDAG is designed to help provide seed money to depressed communities and neighborhoods to undertake economic development projects that would otherwise not likely to occur and has drawn $6 in private investment for every $1 of UDAG funds; assisted over 2,700 projects in more than 1,100 cities; generated more than $600 million in additional local tax revenues; created more than one-half million new permanent jobs; and assisted in the creation of rehabilitation of more than 100,000 housing units. The program has already absorbed a 67-percent cut——

Senator PROXMIRE. Mr. Draper, could you summarize, please?

Mr. DRAPER [continuing]. Since 1981 and it would not be reduced below its current level. We thank you for offering us the opportunity to share our views with you, and we would be happy to answer any questions you might have.

Senator PROXMIRE. Thank you very much, Mr. Draper.

[The statement follows:]

STATEMENT OF DAVID W. DRAPER, AIA, ON BEHALF OF THE AMERICAN INSTITUTE OF ARCHITECTS

Mr. Chairman and members of the Subcommittee, my name is David Draper, AIA, of Collins, Kronstadt, Leahy, Hogan, Collins and Draper, an architectural firm in Silver Spring, Maryland. I am a former President of the Maryland Society of Architects and have participated in numerous HUD-sponsored projects. I am pleased to present the views of the American Institute of Architects on housing and community development appropriations for FY 1988. The AIA is the professional association representing this nation's architects, and as the designers of the nation's built environment, we appreciate the opportunity to appear today.

In the few minutes I have I would like to focus my remarks on three areas of concern--housing rehabilitation, housing production, and community development. As the AIA considers the budget for these activities, two things become immediately clear. First, Congress is unlikely to fund these and other programs at levels any higher than currently exist, because of the enormous federal deficit, and second, current levels of funding are woefully inadequate to meet national needs and goals. That this situation should occur is particularly ironic. Federal housing and community development programs have experienced disproportionate cutbacks compared to other domestic programs. Yet the deficit is larger now than six years ago when the cutbacks began in earnest. As a result, the most vulnerable segments of society have suffered needlessly. And the consequences of the cutbacks are now being paid for not only in the currency of human and social hardship but in taxpayer dollars for the unfortunate and inevitable by-products of poor housing and neglected neighborhoods are disease, joblessness and crime.

The AIA also recognizes that the federal government cannot be the sole source of solutions for our nation's housing and community problems. It must be a partner and facilitator for local and state governments and for the private sector, each of which have their own responsibility for better housing and better community conditions.

The adequacy of housing supply, affordability, and quality for people with modest incomes must be a national social and economic priority but it is also a local, state, and private concern as well because all share in the benefits and consequences of the conditions in which our people live.

For FY 1988, the AIA supports funding for various housing and community development programs at least at the current funding or service levels. Specifically, we support $3 billion for the Community Development Block Grant program, $225 million for the urban Development Action Grant program, $100 million for the Housing Development Action Grant program and $75 million for the Rental Rehabilitation program, along with 7500 units of Section 8 moderate rehabilitation units, and 12,000 units of Section 202 housing for the elderly and handicapped. These amounts are significantly less than the federal government provided for housing and community development six years ago. HUD assisted housing budget authority has dropped by over 60 percent since 1980, while the number of new construction and substantially rehabilitated units have declined from almost 130,000 units to just 16,500. As an architect who personally designed more than 500 units of 202 housing for the elderly during the early 1980's, I have watched this program virtually die of funding starvation. CDBG has declined by a third, and UDAG by two-thirds. Few, if any, other domestic program areas have experienced such dramatic cutbacks.

In the face of these cuts great need persists. Between 1974 and 1983, three million more households joined the list of those earning less than $10,000 a year, while the supply of housing they could afford dropped by 2 million units. Of the 23 million very low income households in this country, two-thirds of them live in substandard housing or pay excessive rent. As many as 5 million additional very low income persons are expected to face serious housing problems by the end of the century. Meanwhile, the Tax Reform Act is projected to cause rent increases of 20 percent, and as investors prepay FHA-insured mortgages, as many as 800,000 units could drop out of the stock available to low income households. Unfortunately, only one fifth of those in need are reached by federal assistance today.

In community after community, the reduced levels of federal assistance has meant increasing hardship. Waiting lists for housing assistance stretch three years or even longer. New housing production for low income persons has virtually halted, severely constricting housing availability for such people in the long run. At the same time, rental rehabilitations frequently displace tenants into markets that cannot absorb them, because the rental assistance to keep them in place barely exists and because little new affordable housing is entering the pipeline. For special populations, such as large low-income families, there is often little hope of easily securing suitable, affordable shelter.

The solution to housing problems lies less in new programs and more in adequate funding of the ones that exist. While it is clear that localities and the states have their own obligation to contribute more resources to housing solutions it is also clear that they will never fill the gap themselves. A continued meaningful federal presence is both appropriate and necessary. CDBG and UDAG are also important tools to address housing problems as well as the underlying economic and social conditions that give rise and impetus to those problems. In our view, these programs have successfully served their purpose and deserve continuation.

CDBG is well-targeted, with the most distressed communities receiving more than three and a half times the amounts received by those less distressed. Overall, CDBG recipients direct 90 percent of their funds to benefit low and moderate income people, compared to the 51 percent required by the law, and the program draws substantial private sums to the projects it supports. Its flexibility to aid housing rehabilitation, infrastructure repair, neighborhood self-help programs, job training, and homeless relief has made an important difference in hundreds of communities over its twelve years of existence. At the same time, the program has accepted increasing responsibility as other programs have terminated, and individual grants are sharply down due to a 37 percent increase in entitlement communities, now numbering 837, and a one-third reduction in program funding. In light of the program's successful track record, and increased demands on its limited funding, an appropriation of at least $3 billion for FY 1988 is in order.

UDAG is designed to provide seed money to distressed communities and neighborhoods to undertake economic development projects that would otherwise not likely occur. Since its inception, the program has drawn $6 in private investments, for every $1 of UDAG funds, assisted over 2700 projects in more than 1100 cities, generated $600 million in additional local tax revenues, created more than half a million new permanent jobs, and assisted in the creation or rehabilitation of more than 100,000 housing units, many for people of low and moderate incomes. The program has already absorbed a 67 percent cut since 1981 and should not be reduced below its current level of $225 million.

Again, we are pleased to have this opportunity to offer our views, and would be happy to answer any questions you may have.

STATEMENT OF RICHARD P. DRNEVICH, DIRECTOR, REDEVELOPMENT AUTHORITY OF ALLEGHENY COUNTY, PA.

Senator PROXMIRE. Our next witness is Mr. Richard Drnevich, director of the Redevelopment Authority of Allegheny County.

Mr. DRNEVICH. Senator, it is a privilege and an honor to speak before you. The Community Development Block Grant Program is the basis of economic and housing development in our communities in Allegheny County. As an entitlement community, Allegheny County received approximately $11 million. The redevelopment authority, which is a subrecipient, received approximately $2.6 million, which we leverage into $24 million of public and private funds.

ACCOMPLISHMENTS LISTED

What did we accomplish? With these funds, 1,500 single-familiy homes have been rehabilitated in that 1 year, most of them occupied by low- and moderate-income families; 350 units were rehabilitated and available at rents affordable to low- and moderate-income residents; 220 rehabilitated townhouses are being made available for sale to low- and moderate-income citizens at a monthly cost of $200, including principal, interest, taxes and insurance; the expansion of five businesses retaining 250 jobs with 325 new jobs created; and 7 neighborhood commercial areas revitalized, with 73 businesses undergoing renovation.

To assist with these projects, we have used the Rental Rehabilitation Program, the federal 312 Loan Program, as well as tax exempt mortgage revenue bonds. If there are reductions in the funding of the community development block grant programs, the Federal 312 Loan Program, the Rental Rehabilitation Program, and the UDAG Loan Program from the 1987 levels, urban renewal will be required in the next 5 to 10 years.

As the director of an urban renewal agency, I can say from experience that urban renewal can do the same thing, but at about 10 times the cost. It is community development and housing programs now or urban renewal later at 10 times the cost.

Community development agencies and redevelopment authorities are trying to do the best job we can with funding levels that have been reduced by one-third since 1980.

IMPACT OF 1986 TAX LAW

In addition, the 1986 tax bill has reduced our ability to issue mortgage revenue bonds to encourage low- and moderate-income homeowners to improve their properties and to extend the economic life of these properties.

Since 1980, we have assisted with rehabilitation of about 8,000 single-family housing units. Most of those were low and mods. This agency has been in discussion with surrounding counties to develop a similar successful program within their jurisdictions. The volume cap of the new tax law makes that impossible.

On behalf of the housing needs, economic development needs of the citizens of Pennsylvania, we kindly request your support for the housing and development programs. We urge that you support the Community Development Block Grant Program at $3.12 billion; the Rental Rehabilitation Program at $220 million; the Federal 312 Loan Program at the repayment levels; the Urban Development Action Grant Program at $330 million, and remove the volume cap for taxes and bonds that provide the majority of benefits to low- and middle-income citizens.

As president and a member of several community development citizens groups in the commonwealth, I can guarantee you these requests are reasonable, very needed and with anything less, we are facing severe problems.

Senator Proxmire. Thank you very much, Mr. Drnevich.

[The statement follows:]

STATEMENT OF RICHARD P. DRNEVICH, DIRECTOR, REDEVELOPMENT AUTHORITY OF ALLEGHENY COUNTY, PA.

MR. CHAIRMAN, MEMBERS OF THE SENATE, LADIES AND GENTLEMEN:

My name is Richard P. Drnevich, Director of the Redevelopment Authority of Allegheny County, Pennsylvania. Thank you for permitting me to testify before you on the critical issues of Housing and Community Development as they may be affected by the 1988 Budget.

The Community Development Block Grant Program is the basis of economic and housing development in our communities. As an entitlement community, Allegheny County received $11,250,000 in 1986. The Redevelopment Authority, a sub-recipient, received approximately $2.6 million. We were able to leverage these funds into over $24 million of other public and private funds. What did we accomplish?

- 1,500 single family homes rehabilitated - most of them occupied by low and moderate income families
- 350 rental housing units rehabilitated and available at rents affordable to low and moderate income residents
- 220 rehabilitated townhouse units made available for sale to low and moderate income citizens at a monthly cost of $200, including principal, interest, taxes, and insurance.
- The retention and expansion of 5 businesses retaining 250 jobs, with 325 new jobs created
- 7 neighborhood commercial areas revitalized, with 73 businesses undergoing renovation

These accomplishments mean reinvestment in our cities and towns; they mean jobs; they mean decent, safe, and sanitary housing for our lower income citizens and they address current problems.

To assist with these projects we have used the Rental Rehabilitation Program; the Federal 312 Loan Program; as well as tax exempt mortgage revenue bonds.

If there are reductions in the funding of Community Development Block Grant Programs; the Federal 312 Loan Program; the Rental Rehabilitation Program; and the Urban Development Action Grants from the 1987 levels - urban renewal will be required in the next five to ten years. As a director of an urban renewal agency, I can say from experience that urban renewal can do the same thing, but at about ten times the cost of community development and housing rehabilitation programs. It is community development and housing programs now or urban renewal later - at ten times the cost.

Community development agencies and redevelopment authorities are trying to do the best job we can with funding levels that have been reduced by one-third since 1980.

If we do not have the programs in place with meaningful funding levels, we are going to have a very vocal constituency in our city centers and deteriorated neighborhoods.

In addition, the 1986 tax bill has reduced our ability to issue mortgage revenue bonds to encourage low and moderate income homeowners to improve their properties and to extend the economic life of the properties. Since 1980, we have assisted with the rehabilitation of 8,000+ single family units in Allegheny County. This agency has been in discussion with the surrounding counties to develop a similar successful program within their jurisdictions. The volume cap of the new tax law may make that impossible.

On behalf of the housing needs and economic needs of the citizens of Pennsylvania, we kindly request your support for housing and community development programs.

We urge you to support

- the Community Development Block Grant Program at $3.12 billion
- the Rental Rehabilitation Program at $220 million
- the Federal 312 Loan Program at loan repayment levels - $100 million (approximately)
- the Urban Development Action Grant at $330 million
- removal from volume cap of the tax exempt bonds that provide the majority of benefit to low and moderate income citizens

As president and a member of several community development organizations in the Commonwealth of Pennsylvania, I can guarantee that these requests are reasonable, very much needed, and, with anything less we are facing major problems.

I have attached a summary of requests.

Finally, I invite you to visit some of the sites that have been successfully completed as a result of these programs, or, if you would like to have additional information regarding the need for funding, we are at your service.

Thank you.

STATEMENT OF LAWRENCE SWANSON, PRESIDENT, PENNSYLVANIA LOW-INCOME HOUSING COALITION

Senator PROXMIRE. Mr. Swanson?

Mr. SWANSON. Mr. Chairman, distinguished members of this committee, my name is Lawrence Swanson and the testimony I will present today is on behalf of the Pennsylvania Low-Income Housing Coalition. We were formed in February 1986, which probably makes us one of the newest housing organizations, and it is a pleasure to be here with one of the newest in the country. The coalition represents some 250 nonprofit housing organizations throughout Pennsylvania as a combination of urban and rural nonprofit housing producers, tenant action groups, and operators of homeless shelters. Mr. Chairman, with your permission, I would ask that my extended remarks be inserted in the record.

Senator PROXMIRE. It certainly will be printed in full, Mr. Swanson.

INCREASED FUNDING REQUESTED

Mr. SWANSON. Thank you. The Pennsylvania Coalition asks the committee to increase funding for the community development block grant, public housing, and the range base of tenant-based subsidies. An annual commitment of 10 percent to increase funds would begin to restore adequate funding of these programs.

Based upon Pennsylvania's experience, we believe a combination of targeted funding for lower income persons and local flexibility will create the opportunity for local solutions to our housing problems.

Overall housing subsidies in 1987 have been projected to be $42 billion. That, of course, includes tax subsidies to first- and second-owner occupied homes, of which less than 20 percent will be spent in low- and moderate-income households. The coalition suggests a longer range goal of increasing direct revenue-based subsidies to lower income households until they at least equal the tax subsidies to middle- and upper-income households.

The current budgetary reductions for housing are producing small, short-term savings which have a negligible effect on the overall federal budget. These reductions are producing longer term costs, which are now becoming evident. The cost of providing shelter to a homeless family is two to three times the cost of supporting them in assisted housing and in conditions that are less than desirable.

In Pennsylvania, as throughout the nation, we understand that housing is expensive. It is expensive to construct, expensive to maintain, expensive to subsidize, and even more expensive to subsidize when persons find themselves without it.

The Philadelphia Committee on the Homeless has documented that it costs some $13 per day to provide emergency shelter for an individual. On an annualized basis, that is $4,800 a year. This is very close to the annual cost of subsidizing a family to live in HUD-assisted housing, new construction or rehab, and far more than it costs to subsidize the same family in existing housing with one of the tenant-based subsidies.

REDUCED FEDERAL APPROPRIATIONS COUNTERPRODUCTIVE

The absurdity of saving housing funds by reducing federal appropriations is documented when a particular family is moved to a shelter. There, a variety of federal, state, local, and private sources will subsidize the family at an even higher rate. That family will then, hopefully, be placed from this higher cost shelter to assisted housing when the units can be located. If they cannot be found, then the family may remain in the shelter at a higher cost to society.

The above comparison ignores the issue of human dignity and the emotional loss. Some of the persons entering the shelters will never again be productive, that is economically, members of our society again. What higher cost can we experience than that? The answer is that the same person can also become socially alienated, as well. The coalition supports the continuation of community and neighborhood-based production of low-income housing.

I would like to close with a personal comment. Last Friday I was in Philadelphia, in north Philadelphia, one of the most deteriorated neighborhoods, a city that has 4,000 homeless individuals. There is extensive vacant housing in that city and there is no means to take that housing and put it into productive use.

At the same time, last night I was fortunate enough to spend the night in McLean, Va., and in traveling to the committee meetings this morning, I passed lots that sell for $300,000 in a booming economy of $1 million housing in that area.

I think that it convinced me once again, although it escapes me why it is, when the Senator asks, "How do we convince people to make this a major objective?" The coalition is not attacking the deductibility of first and second homes, the interest payments, but we are really asking that we set a goal of balancing that with subsidies for lower income persons.

Thank you, Senator.

Senator PROXMIRE. Thank you very much, Mr. Swanson.

[The statement follows:]

STATEMENT OF LAWRENCE A. SWANSON, PRESIDENT, PENNSYLVANIA LOW-INCOME HOUSING COALITION

Summary of Testimony

The Pennsylvania Low-Income Housing Coalition asks the Committee to increase funding for Community Development Block Grant, Public Housing and the range of tenant based subsidies. An annual 10% commitment to increase funds would begin to restore adequate funding of these programs. Based upon Pennsylvania's experience we believe a combination of targeted funding for lower income persons and local flexibility will create the opportunity for local solutions to our housing problems.

Overall housing subsidies in 1987 are estimated to be 42 billion dollars (including tax subsidies to first and second owner occupied homes) of which less than 20% will be spent in lower and moderate income households. The Coalition suggests a longer range goal of increasing direct (revenue based) subsidies to lower income households until they at least equal the tax subsidies to middle and upper income households.

The current budgetary reductions for housing are producing small short term savings which have a negligible effect on the overall federal budgets. But these reductions are producing longer term costs which are now becoming evident. The cost of providing shelter to a homeless family is two to three times the cost of supporting them in assisted housing and in conditions that are less than desirable.

The Pennsylvania Low-Income Housing Coalition supports the continuation of community and neighborhood based production of low income housing. The important and irreplaceable role of HUD is to act as a stable funding source and provide a basis for local capacity and initiative. The proposed level of funding is inadequate to continue the long term commitment to urban and rural housing programs as well as serve the lowest income households.

Mr. Chairman, distinguished members of the Committee, my name is Lawrence Swanson and the testimony I will present today is on behalf of the Pennsylvania Low-Income Housing Coalition. The Coalition was organized in February of 1986 and currently represents some two hundred and fifty non-profit housing organizations and individuals throughout Pennsylvania.

Mr. Chairman, with your permission, I would like to submit my formal remarks for the record, and provide a short statement to you now.

The basis of my testimony today is a study of the state of Low-Income Housing published by the Coalition in September of 1986. This study, entitled "Decent Affordable Housing: Pennsylvania's Missing Keystone" examined the impact of successive years of Federal Budget housing reductions and what it has meant to Pennsylvania. Today I will summarize the major findings of that report to describe the cumulative impact of budget cuts on housing.

The Pennsylvania Low-Income Housing Coalition finds that hundreds of thousands of Pennsylvanians are living in continually declining housing environments. The dominant experience of those who are housed inadequately is that the actual cost of housing is far greater than the amount that they can pay and still afford the costs of eating, travelling to work, clothing themselves, caring for their children, getting medical care and similar basics. Further, during the past 16 years, inflation in housing prices has exceeded increases in income by far. The poor condition and suitability of the existing housing stock is a slightly less dominant but equally troubling problem: overcrowding, lack of plumbing, lack of weatherization, and generally substandard conditions are widespread. Finally, the recession of the early 1980's led to shortages in production, during a period of growth in the number of households, that has torn a gaping hole in the overall supply of housing units; this has dramatically narrowed the choices in the housing market for all Pennsylvanians.

The "Bottom Line" Needs

At least 1,060,000 households (2.2 million or close to one out of every five Pennsylvanians) are at 150% of poverty level income or below; the federal government has acknowledged that such households need financial assistance to ensure their ability to pay for decent housing.

Homelessness caused by housing inaffordability has been the experience of thousands of Pennsylvanians and is growing.

More than 100,000 households are living in overcrowded housing and need a larger unit to accomodate their families.

There are 600,000 substandard housing units; 458,000 of these units could be rehabilitated and the remaining 142,000 units must be replaced.

In order to restore balance to the housing market and merely keep even with the 1970's (when there were fewer households), without even addressing substandard conditions, Pennsylvania must produce 527,000 housing units during the second half of the 1980's. Current production levels are less than one half of what is needed.

The structure of housing problems is defined by the unique circumstances in local markets and requires flexible responses: for example, some localities have dangerously low vacancy rates, indicating a net need for more units, and others have widespread substandard conditions, indicating the need for rehabilitation.

The Pennsylvania Low-Income Housing Coalition calls upon the Administration and Congress to recognize that the housing budget reductions represent relatively small short term savings that are producing massive long term costs. The restoration of Public Housing, Community Development Block Grants and Housing Assistance Funds to reasonable levels would be a first step toward recognition of that reality. The proposed 11% reduction in the Senate Bill will greatly reduce both local capacity to produce housing for low-income persons as well as deny them access to the existing housing that is available.

Pennsylvania is a state of housing contrasts. It contains two of the major urban centers of the nation, a large number of smaller cities and yet Pennsylvania has the largest rural population of any state in the United States. These basic contrasts when combined with greatly varying private market conditions require a housing policy that is based upon local solutions in terms of production while providing both tenant based subsidies and public housing to serve those households in the greatest need. Each of these programs has proven to be effective when administered properly and within the context of a neighborhood/community based strategy.

The City of Philadelphia lies in the heart of a metropolitan area with a rapidly expanding economy. There is economic growth and yet the City has a homeless population of 4,000 and it continues to grow. Suburban Montgomery, Chester and Bucks Counties are experiencing large scale production of higher income targeted sales and rental housing. Very little moderate and almost no low income housing is being produced.

Thus the expanding service oriented employment centers in the suburbs have reached a crisis stage in locating employees. This occurs while some groups in Philadelphia experience 30% unemployment rates. Clearly the lack of an effective housing strategy that is adequately funded is creating severe dislocations in the economy of Southwestern Pennsylvania. The cost to the nation of revenue based housing subsidies to this market would be minimal since it would facilitate economic growth and reduce dependence on transfer payments. Such a housing strategy cannot occur absent reasonable levels of federal funding.

Pittsburgh and Allegheny County represent the other major urban center in Pennsylvania. This metropolitan area has withstood longer and more severe economic dislocations than any comparable urban center. The iron and steel industry has been in cyclical decline since the early 1950's. The dependence of the region on heavy manufacturing has meant that growth in the service sector has only balanced other losses. After a period of thirty-five years of such transition this area is also one of tremendous contrasts.

Because of its longer term problems Pittsburgh has long been an innovator in housing and civic policies. Survival as a viable urban center has brought some concensus to this disparate situation. Today there is limited growth in higher income oriented sales and rental housing. There is however a strong and growing community based capacity to produce moderate income sales and rental housing.

Two glaring short comings in the market are obvious. First, very little new low income housing has been produced in the last two years. This has made economic transition more difficult for the recently unemployed or under-employed. The spatial concentrations of housing dislocation in the Monongahela Valley industrial area have challenged local resources. Preservation of moderate quality and affordable housing has become a serious issue.

Pittsburgh and Allegheny County have long been leaders in use of Community Development Funds, tenant based subsidies, UDAG and urban rehabilitation programs to shape local strategies. This has led to the development of a strong base of local public, civic, non-profit and private capacity to produce effective stragegies. And yet, the continued withdrawal of federal funds when combined with a very slowly growing economy threatens to destroy these local efforts. The Pittsburgh and Allegheny communities represent a tradition and a social cohesion that if destroyed could not be re-created. The long term cost in terms of transfer payments and economic dislocations would far outweigh even long term housing subsidies.

Such community capacity exists throughout Pennsylvania in many medium sized cities, in smaller cities and small towns. The Pennsylvania Low-Income Housing Coalition supports Community Development Funding because it creates the opportunity for community based strategies to respond to housing problems. The long term cost effective housing strategies are almost always those that result from intensive neighborhood based, community and civic involvement.

Pennsylvania has a rural population of nearly five million (5,000,000) persons. Its rural poverty is more extreme and harder to respond to than that of urban centers. The traditional values of rural Pennsylvanians and the lack of an effective service system has magnified these problems. Nothing could be more ironic than Pennsylvania's annually returning Federal FmHA 515 funds for low-income rental housing while having severe housing problems. The shallow nature of these subsidies when combined with a generally weak rural economy has made utilization of these resources difficult.

The housing problems of rural Pennsylvanians frequently elude the system inherent in CDBG funds, tenant based subsidies and public housing. Effective treatment of rural housing problems requires the appropriate funding of regionally based public or non-profit entities that can use their capacity to begin to respond to housing problems. The problems are long term and only gradual and continued funding of such capacity will enable Pennsylvania to respond to the rural housing problems.

And finally Pennsylvania contains a large number of medium and small cities and towns. Many have effectively used previous and current HUD programs in a manner that is quite unique. In Pennsylvania, as elsewhere, Public Housing has been carried out much more effectively in these communities. The scale of the communities, civic involvement and different tenant populations have frequently combined to produce high quality housing.

Civic leadership has often been a key element in the success of public strategies in these communities. Community Development funds have been an absolutely critical element in these communities and its reduction or threat of eradication is a serious problem that has not been addressed. Smaller cities and towns have limited capacity to substitute sources of revenue and thus rely on these funds to respond to the most urgent housing problems.

In Pennsylvania as throughout the nation we understand that housing is expensive. It is expensive to construct, expensive to maintain, expensive to subsidize and even more expensive to subsidize when persons find themselves without it. The Philadelphia Committee on the Homeless has documented that it costs some $13 per day to provide emergency shelter for an individual. On an annualized basis this is $4,800 per year. This is very close to the annual cost of subsidizing a family to live in HUD assisted housing (new construction or rehabilitated) and far more than it costs to subsidize the same family in existing housing with one of the tenant based subsidies.

The absurdity of saving housing funds by reducing federal appropriations is documented when a particular family is moved to a shelter. There a variety of federal, state, local and private sources will subsidize that family at an even higher rate. That family will then, hopefully, be placed from this higher cost shelter to assisted housing when the units can be located. If they cannot be found then the family will remain in the shelter at the higher cost to society.

The above comparison ignores the issue of human dignity and emotional loss. Some of the persons entering shelters will never become productive (economically) members of our society again. What higher cost can we experience than that? The answer is that same person can also become socially alienated as well.

When we state that all housing is expensive to subsidize we also hasten to add that all housing is subsidized. The Office of the Management and the Budget (OMB) has argued persistently for some six years that tax expenditures and revenue expenditures are essentially the same. OMB's zeal was oriented towards eliminating tax advantaged investments, curtailing tax exempt bonds and financing and eliminating federal financing vehicles. Any yet if the OMB is correct then it is easy to show that middle and upper income American's receive a greater housing subsidy than those who live in tenant based rental assisted units. The value of that subsidy is greater since it will enable that household to own an appreciating asset - their first or second home.

Current estimates are that all housing subsidies will cost some 42 billion dollars in 1987. Those which will go to lower income American's either directly or indirectly will be less than 20% of this expenditure. The rate of growth of tax expenditures as housing subsidies is greater than direct ones to low income households. The Pennsylvania Low-Income Housing Coalition argues that from a public policy perspective it makes more sense to increase subsidies to lower income households while maintaining the preferred status of homeownership. In fact, the coalition strongly supports the proposed Nehamiahah Housing Grant program that would seek to expand low income homeownership opportunities.

The Coalition has been repeatedly advised that the best possible scenario for 1987-1988 Federal appropriation for housing is to maintain or slightly increase the 1986-87 appropriation. While struggling with a budget in need of balancing we ask the committee members to consider the trade-offs between short term savings and long term costs. The gradual reduction in housing funds has, in effect, lessened local capacity to respond to community needs. We ask the Committee to increase funding over 1986-87 levels for Community Development Block Grant Funds, Public Housing and the package of tenant based subsidies housing by at least 10%. We further request your consideration of increased targeting of CDBG funds to lower income persons. As a goal we believe it is appropriate that we seek to create an equality between subsidies to lower income households with that of other American's. Such a plan would recognize the important and unique role played by housing in building sound and viable neighborhoods, communities and cities. It would also begin the process of recommitting our society to providing decent housing and opportunities for a safe living environment for all American's.

STATEMENT OF ROBERT PLOEHN, EXECUTIVE DIRECTOR, ERIE COUNTY DEVELOPMENT CORP., PA.

Senator PROXMIRE. Our next witness is Robert Ploehn, executive director of Erie County Development Corp.

Mr. Ploehn, go ahead, sir.

Mr. PLOEHN. Thank you, Senator, and I appreciate the opportunity to be here, and I appreciate the pronunciation of my name correctly. It is rather difficult.

Senator PROXMIRE. I had a lot of assistance on that. That was really a tough one. Thank you. Is that a German name?

Mr. PLOEHN. Yes, sir; it is Dutch-German. It depends on who we are friends with. [Laughter.]

Senator PROXMIRE. You have got a lots of friends in Wisconsin. We have got more Dutch-German than any state in the union, including Pennsylvania.

ECONOMIC DEVELOPMENT BENEFITS

Mr. PLOEHN. I actually speak as the legislative chairman of the Pennsylvania Economic Development Association. I come before you to discuss the economic development benefits derived from the community development block grant and urban development action grant programs.

Also, I would like to emphasize that these programs are not operating in a vacuum. Therefore, I have very short remarks for the record about the Appalachian Regional Commission, Economic Development Administration, and industrial development bonds, which have been referred to earlier.

I testify not as an elected official, but as a bureaucrat representing over 200 economic developers in Pennsylvania. We have one goal, and that is increasing our net new jobs in our communities, producing additional wealth in our communities. I would assert that providing these job opportunities solves many other problems downstream.

CDBG PROGRAM

The CDBG program partially is directed toward economic development, and the beauty of this program is that localities can determine their own priorities and fund them within broad federal guidelines very quickly. As a successor to the federal redevelopment programs, the CDBG program can react so quickly as to alleviate problems of depression and blight within months. This decentralized program is a classic example of a federal effort of helping communities to help themselves.

On a broad scale, this program has provided funds so industries can remain in center cities of Pennsylvania, where there is existing infrastructure. CDBG funds are also used by our agency to provide assistance each year to small businesses as a one-stop agency, a traffic cop, if you will, to direct firms for maximum utilization of labor training, land real estate, capital assistance, and technical assistance.

On the UDAG program, this program has the decentralization of community development block grants, and it truly is the dog wagging the tail. Previously, redevelopment programs would study and study and study and finally would advertise for developers.

We have a program that works with the Urban Development Action Grant Program. We have the private sector leading and the government aiding that lead.

In Erie, Pa., Senator, this program has singlehandedly been responsible for the regeneration of our downtown center city district. Over six blocks have been regenerated at a total estimated cost so far over the last 6 years of $80 million, and that was instigated by $7.4 million in UDAG grants to the Erie Insurance Group.

This program, I would assert, Senator, takes private capital with federal capital and gives us true synergism.

Finally, as the ARC and EDA have also been increased and industrial revenue bonds have been decimated by the Tax Reform Act of 1987, economic development practitioners are lacking adequate tools to help the private sector stay in America and produce jobs.

The federal government working in leverage with state, regional, and local programs has been a partner with the private sector to increase capital investment, increase jobs, and increase individual and corporate tax revenues.

I would just ask, Senator, that we study these programs in concert and study how they work together, all the federal programs we have working in the economic development area, and study them not on an anecdotal basis or on an isolated basis, but an overall comprehensive approach to providing more job opportunities for Americans.

Thank you.

Senator PROXMIRE. Thank you, Mr. Ploehn, very much.

[The statement follows:]

STATEMENT OF ROBERT H. PLOEHN, EXECUTIVE DIRECTOR, ECONOMIC DEVELOPMENT CORP. OF ERIE COUNTY, PA.

I thank this sub-committee for the opportunity to testify today on the impact of various federal programs which are charged with furthering economic development in the U.S. I testify not as an elected official, or one who makes policy, but as a bureaucrat who operates the programs. As such, I represent hundreds of technicians in Pennsylvania who are at the front line of economic development programs in our Commonwealth. We touch and feel and see these programs every day. And we can relay to you and other elected officials the quality of the programs we see in Pennsylvania in 1987.

Today, I would like to touch on the impacts of Community Development Block Grants, Urban Development Action Grants, the Economic Development Administration, and the Appalachian Regional Commission. These four programs, together with state economic development initiatives, are the primary sources of funding for numerous projects in conjunction with local municipalities and regions.

Community Development Block Grants

The C.D.B.G. program partially is directed toward economic development. The beauty of this program is that localities can determine their own priorities, and fund them, within broad federal guidelines. This process is enhanced by the public participation process--public hearings to receive comments and suggestions and ways to further community development. As the successor to the federal redevelopment programs, the C.D.B.G. program can react far more quickly to alleviate problems of distress and blight. This decentralized program is a classic example of a federal effort of helping communities to help themselves.

Urban Development Action Grants

The U.D.A.G. program has this decentralization also--the private sector is the initiator of the specific project, which then goes through local and federal review. What a vast improvement over the 1960s and 1970s when governmental agencies, after years of studies and consultant reviews, determined what development was to take place and then advertised for developers. That was the tail wagging the dog. Now we have the private sector leading, with the support of the government.

The Economic Development Administration

This program, under attack by the Administration for many years, is the kernel of hope for many depressed communities. If you are a distressed community and you find the largest industry closing, displacing hundreds of workers and impacting on thousands of people, this program can give hope to the community. It can and does inspire communities to "get their act together."

In Pennsylvania, E.D.A. funds have been used for regional and statewide revolving loan funds which are responsible for the creation of thousands of net new jobs in our communities. In just the eight Northwest counties of the state, the E.D.A.'s funding spurred state and local funding so that today we can look to over 3,600 new jobs created in the manufacturing and "export-service" sectors of our economy--the sectors which create new real wealth. In a region of slightly over three-quarters of a million people, this impact is substantial. In a depressed region surrounded by the depressed economies of Buffalo, Cleveland, Akron-Canton, Youngstown, Pittsburgh, and Altoona-Johnstown, industry was looking for a glimmer of hope, a reason to hang on in a region of many millions that has been in decline for almost a decade now.

Likewise, recent E.D.A. emphasis has been on entrepreneurial development and the creation of industrial incubators to spur new firms, new techniques and processes, new products, and--more importantly--new jobs. In the so-called "rust belt," this effort creates hope, and encourages entrepreneurship in home towns. At this juncture, hope precedes action; for without hope, people move on and ghost towns are created.

Lastly, the E.D.A.'s funding of sewer and water lines, access roads, and other infrastructure improvements has been tied to specific opportunities for job creation. Please, I ask of you, do not look to studies of five or ten years ago perpetuating the myth that the E.D.A. is a pork barrel agency, handing out plums to communities for reasons other than distress and job creation opportunities. I myself operate programs with the assistance of the E.D.A. Does that make me partial? Of course it does, when I have seen first hand the creation of thousands of new jobs in Erie County, Pennsylvania, because the E.D.A. invested a few dollars. I say a few dollars, because when you total the matching public share as well as the private investment spurred by the federal grant, you discover an E.D.A. to other investment ratio of better than 10 to 1. The E.D.A. is a vital, necessary, part of our federal government. It should be strengthened. A modest increase in funds should be supported. And most importantly, Congress should sponsor independent studies to determine the overall, not isolated, effects of its programs in the last three or four years. I am confident the results will be impressive on the scorecard of job creation, employment opportunities and private investment.

The Appalachian Regional Commission

I have left the most precarious agency for last--the A.R.C. This product of the "New Frontier" and the "Great Society" is the target of a concerted effort to kill it. Opponents cite the continuing distress of the region as the reason it should be disbanded. They say that because distress has not been relieved, that the agency has not done its job. That is like saying because there still is hunger in America the Food Stamp program should be killed. Others cite more "pork barrel" abuses.

Let me tell you about Pennsylvania. The distress in rural communities is overwhelming. One need only do a "windshield survey" of small rural towns to see first hand the blight, the depressed economies, the despair in many cases. Appalachia needs more attention, not less. As the East, South and West Coasts prosper, the rural poor of Appalachia hang on largely because of the A.R.C. programs which have created health and dental care where there was none, built roads so that commerce can be conducted, and spurred economic development.

Again, in Northwest Pennsylvania, A.R.C. program funds have been directed in the past four years to leveraging other capital for job creation and additional investment. The industrial incubator program has resulted in investments in four facilities of slightly over $600,000 since 1983. So far, thirty nine new firms are now employing over 550 people. These are business start-ups which most likely would not have taken place without the benefit of a facility and the small business assistance program unique to an industrial incubator. Does the A.R.C. program work today? Yes, come to Northwest Pennsylvania and ask the people. People who are employed, paying taxes, raising families.

Summary

Today, as an economic development technician, I come before you to ask you to continue and strengthen these programs. I challenge you and your staffs to visit facilities and firms which have been assisted by the C.D.B.G., U.D.A.G., E.D.A. and A.R.C. programs. Make site inspections. Ask for independent audits, not on the anecdotal, isolated-abuse, basis, but on overall effectiveness. Come see for yourself the improvements in physical facilities, community pride and determination, economic well being. A strong "heartland" of America means we should encourage people to stay in their communities with existing infrastructure. But to do that requires help, the help that only the federal government can provide in concert with the states, regions and local governments to spur private investment.

AIA INVOLVEMENT WITH NEIGHBORHOOD REINVESTMENT CORPORATION

Senator PROXMIRE. I just have two quick questions and then Senator Sarbanes will be our witness after this panel.

Mr. Draper, you have emphasized in your statement that the needs in the housing and community development sectors are great, but the federal government is limited in what it can do.

It seems to me that one organization doing a marvelous job of encouraging private sector involvement is the Neighborhood Reinvestment Corporation. Are you familiar with that?

Mr. DRAPER. I have heard of it; yes.

Senator PROXMIRE. William Whiteside is the moving force there. I think they have done really a remarkable job. They received a mere $19 million from the federal government this year, and they have rehabilitated a large number of neighborhoods; they have been very successful. Much of it is done on a volunteer basis and done with local help and local support.

What steps is the American Institute of Architects taking to encourage the work of the Corporation going through the Neighborhood Housing Services Program and the like?

Mr. EISENBERG. That is probably a broader question that I should be able to answer. I am Mr. Eisenberg, and I am director of AIA.

Senator PROXMIRE. You are an old friend of the committee and of the Congress. You have served as a staff man and you have done superlative work. Go right ahead.

Mr. EISENBERG. Thank you very much, Mr. Chairman. I always appreciate that kind of a statement when I am appearing with one of our members.

The Neighborhood Reinvestment Corporation is, as you know, a very small national organization which does a lot of good work in community efforts in communities throughout the country. Architects, of course, participate with it as they can with respect to individual projects.

There are a number of projects that they engage in which may not call, necessarily, for the services of architects. I am sure that there are some projects which would benefit from the involvement of what we would call community design centers, which are the architectural version of legal aid societies. They are community-based architectural-type organizations which provide services to neighborhood development activities.

In that context, the AIA is a participant, not so much at all on the national level; much more so on a local community-by-community level. I would have to add, though, that despite the good work that the Neighborhood Reinvestment Corporation does, like any other organization of its type, in order to accomplish its job, it has to find resources, and the resources that are out there are increasingly limited.

We are talking about partnerships, and as one of the other individuals at the table mentioned, housing costs money, and in order to be able to secure that money, you have got to go to people that have it. The federal government has been a major player in this area, but it is less of a player now, and I can tell you from the perspective of a local official, not just wearing the AIA hat, but from a local official's perspective, that things are tough out there, very tough, and the federal government is not now holding up its share of the partnership.

It is regrettable, but it is a fact that I think I have to say.

Senator PROXMIRE. Let me be direct. The reason I raised that point is because I wanted to call the attention of your excellent organization, the architectual group, to this opportunity. Mr. Eisenberg, obviously, is familiar with it.

The great strength of the Whiteside operation is that he and his agency work so effectively with private groups, with banks and other institutions and has been successful in raising many, many, many times more in private funds than the very small amount he gets from the federal government.

Thank you very much. That is very helpful.

URBAN DEVELOPMENT ACTION GRANTS

I would like to ask Mr. Ploehn one question. You give us a strong vote of confidence in your testimony on the Urban Development Action Grant Program. Some of us are inclined to believe that many UDAG programs would be going forward without federal funding because they make sound business sense.

Can you point to any evidence that indicates UDAG funds are essential to the initiation of most of these projects?

Mr. PLOEHN. As you well know, sir, as part of the process of UDAG application, the applicant is, indeed, required, as you know, to say that but for the program, this investment would not go forward.

You smile, sir.

Senator PROXMIRE. I sure do.

Mr. PLOEHN. We do believe that we do have honest business people in our community.

Senator PROXMIRE. You do, but of course, this is a subjective judgment. Many of these UDAG communities have been based primarily on hotels and luxury office buildings and so forth, in many cases, in overbuilt communities, and I am skeptical about that particular federal program compared to the housing programs that we have represented here at the table.

Mr. PLOEHN. I would just like to add a couple of points, sir: That, No. 1, I would say we have three or four prospective UDAG grants for every one that will actually sign that statement. For example, Welch's foods in Northeast program, where your grape jellies and jams come from. They examined the program and they could not sign the statement.

Numerous other firms in our community look at that and say, "Yes, indeed, we would go forward." We are convinced on a local level, of which I can only speak, that the local firms which haven't taken advantage of this program, indeed, very honestly, very sincerely, would not have made the investment without it. How do we second guess it? There is no perfect answer to that.

Senator PROXMIRE. Thank you very, very much.

ENVIRONMENTAL PROTECTION AGENCY

STATEMENT OF HON. PAUL S. SARBANES, U.S. SENATOR FROM MARYLAND

Senator PROXMIRE. Our next witness is Senator Paul Sarbanes.

We are honored and flattered. Senator Sarbanes is very, very busy, to come and testify for the Subcommittee.

Senator SARBANES. Mr. Chairman, I very much appreciate the opportunity to come before the subcommittee. I have a full statement which I will submit for the record.

Senator PROXMIRE. It will be printed in full in the record.

Senator SARBANES. I will try and summarize it, because I know that there is a great deal of pressure on the committee's time and on your time.

CHESAPEAKE BAY PROGRAMS

I appreciate this opportunity to testify on the funding request for the EPA's Chesapeake Bay programs. Mr. Chairman, this is a matter that is very near and dear to our hearts in the Chesapeake Bay area. In fact, recently, I and the five other Bay area Senators—my colleague Senator Mikulski and the two Virginia Senators and two Pennsylvania Senators—wrote to the committee to request your approval of a $13 million appropriation for fiscal year 1988 for this program. It is of great importance, critical importance to the EPA and the bay cleanup effort.

I ask that a copy of that letter be included in the record.

Senator PROXMIRE. Without objection, that will be done.

[The letter follows:]

LETTER FROM SENATOR PAUL S. SARBANES ET AL.

May 5, 1987

Honorable William Proxmire
Chairman
Subcommittee on HUD-Independent Agencies
Committee on Appropriations
SD-123
Washington, D.C. 20510-6025

Dear Mr. Chairman:

We are writing to request that the Subcommittee include $13 million in the fiscal 1988 appropriations bill to continue and enhance the Environmental Protection Agency's (EPA) vitally important activities in the Chesapeake Bay.

As you know, an aggressive Federal-State program is underway to restore this national treasure to health. This program is heralded as a model for estuarine restoration efforts in other parts of the country and as a outstanding example of intergovernmental cooperation and environmental management. EPA is the lead federal agency and coordinator of the Chesapeake Bay Program. Its activities and overall management are vital to the continued success of the Bay clean-up effort.

We greatly appreciate the Subcommittee's assistance last year in approving $10 million for EPA's Chesapeake Bay Program. Approximately $7.5 million of these funds is being used for cost-sharing grants to the states to implement the recommendations of the 1983 Bay study. The three Bay states and the District of Columbia match these funds on a 50/50 basis and have so far committed over $200 million in new State dollars since the inception of the restoration effort. The remaining $2.5 million is being used for the Chesapeake Bay Liaison Office and related activities, including citizen participation, water quality modeling and maintaining data bases. This funding has set in motion a comprehensive set of strategies designed to rejuvenate the Bay. Though an effective partnership of federal, state and regional agencies and citizens organizations, much progress has been made in the past two years.

However, our work on the Bay is still in its infancy. We have just completed the first critical phase of the clean-up effort. Full funding at the $13 million level authorized in the recently enacted Clean Water Act for EPA's activities in the Chesapeake Bay is essential to assure effective implementation of phase II of the program.

Your approval of the funding would help to ensure the program's continued success. We hope we can count on your assistance.

With best regards,

Sincerely,

Barbara A. Mikulski
United States Senator

Paul S. Sarbanes
United States Senator

Arlen Specter
United States Senator

John Heinz
United States Senator

Paul S. Trible, Jr.
United States Senator

John W. Warner
United States Senator

Senator SARBANES. I want to thank this committee right at the outset for your assistance to the bay over the years. You appropriated the first funds in 1975 that led to the famous EPA Chesapeake Bay study, which provided the impetus for the joint federal-state cleanup program that is now underway. For all of those who have been concerned about saving the bay, we are deeply appreciative to you.

BAY RESTORATION PROGRAM

As you know, in voting to override the President's veto of H.R. 1, the Water Quality Act of 1987, earlier this year, within that bill was the authorization of the Chesapeake Bay program at $13 million a year over a 4-year period to continue the state-federal Chesapeake Bay program.

Of that $13 million, $3 million of it is to go to maintain the office of the Chesapeake Bay program of the EPA in Annapolis, and $10 million is used as cost-sharing grants to the states.

This program, of course, is the culmination of a 7-year, $27 million EPA Chesapeake Bay study. We made great progress in laying the groundwork for the restoration, protection, and enhancement of this great natural resource since the study was completed.

JOINT FEDERAL-STATE PROGRAM

At the end of 1983, the EPA, the states of Maryland, Pennsylvania, Virginia, and the District of Columbia, signed the historic Chesapeake Bay agreement, and since then, they have been carrying out a coordinated program to achieve solutions to the Bay's problems.

The EPA coordinates these Bay-related activities within the federal government, and it works closely with the states in developing the Restoration Protection Program.

Mr. Chairman, I want to underscore that this joint federal-state program has received tremendous reviews. The Office of Technology Assessment of the Congress, in a recent study, called this a model for other estuaries around the country and an outstanding example of intergovernmental cooperation and environmental management.

ROLE OF EPA

EPA is the lead federal agency in this effort. It coordinates the baywide monitoring network; it manages the computer data base; it supports citizen participation and education; it participates in the development of the water quality models and oversees the disbursement of cost-sharing grants.

Beyond that, EPA is really the group which holds the bay program together. It is really the EPA's involvement, its ability to function, that serves as a magnet, as it were, to hold the states and the localities and the private sector into this program. The states must match, of course, the funds which EPA provides out in cost-sharing grants.

In addition, the states have, on their own, adopted far-reaching initiatives. They have expended over $200 million in state money for the cleanup efforts since the signing of the Chesapeake Bay agreement. Maryland has allocated over $130 million to support 35 bay initiatives; Virginia, over $50 million for 30 initiatives; Pennsylvania has committed $10 million to deal with agricultural nonpoint source pollution control programs; the District of Columbia has acted with respect to improving the Blue Plains sewage treatment and the water quality of the Potomac and Anacostia Rivers.

The executive council which oversees the implementation of state and federal programs has just issued its second annual progress report under the Chesapeake Bay agreement.

I will submit that for the record, Mr. Chairman.

[The report follows:]

CHESAPEAKE EXECUTIVE COUNCIL

SECOND ANNUAL PROGRESS REPORT
UNDER THE
CHESAPEAKE BAY AGREEMENT

FEBRUARY 1987

Foreword

TO THE SIGNATORS OF THE CHESAPEAKE BAY AGREEMENT AND THE PEOPLE OF THE REGION:

It has been a privilege and a pleasure to serve as the Chairman of the Chesapeake Executive Council in 1986, a year in which I believe we have made significant progress under the Chesapeake Bay Agreement.

First, the structure which the Council established works. The Implementation Committee and its subgroups have developed an agenda we call Phase II which will enable us to refine current efforts and to design and implement the next generation of Bay restoration and protection programs. We have improved our modeling capabilities to assist in that refinement. The monitoring network established in 1984 has provided a new baseline from which we can measure the progress of cleanup efforts. We began to develop habitat and living resources objectives which, when combined with monitoring data and modeling projections, will tell us how great a reduction of nutrients and other pollutants is required to bring back the Bay. We launched new toxics initiatives to pinpoint and better control the sources of contaminants. The states have made great strides in delivering programs to reduce the loadings of nutrients and toxic substances to tributaries and the Bay from urban and agricultural nonpoint sources. We are now embarked on a major reassessment of our pollution control needs and the technology to meet them.

The Scientific and Technical Advisory Committee (STAC) challenged us with their report on the control of nutrients from point sources, and the Council members responded by taking action to demonstrate nitrogen removal technologies.

The Citizens Advisory Committee (CAC) reorganized into five task forces to provide the Council with advice on important issues. With the staff of the Citizens Program for Chesapeake Bay, Inc., the CAC worked hard in 1986 to increase public interest and participation in Bay issues.

The Council was politically visible in 1986 when it sought to influence the programs of the 1986 Farm Bill to promote maximum effect on the Bay. The Council was among the first to recognize the problems boat paints containing tributyltin may be causing. Bay Program efforts were evaluated publicly when agencies of our Implementation Committee and the CAC testified before a Congressional hearing chaired by Senator Charles McC Mathias in June. A healthy reexamination of our structure and processes followed and is now to be a continuing effort.

One result of the self-examination was the initiation of the chairmanship rotation procedure envisioned by the signators of the Agreement. Council chairmanship will rotate between the U.S. Environmental Protection Agency (EPA) (representing the federal government) and the states. EPA will hold the chairmanship on alternate years.

EPA looks forward to being an active member of the Council during 1987. I anticipate it will be a year when momentum increases and when both the program and the partnership of the Bay Agreement become even stronger.

James M. Seif
Chairman
Chesapeake Executive Council

CHAPTER ONE

Achievements under the Chesapeake Bay Agreement

WORKING TOGETHER– THE EXECUTIVE COUNCIL IN ACTION

When the Chesapeake Bay Commission, U.S. Environmental Protection Agency (EPA), Maryland, Virginia, Pennsylvania and the District of Columbia (D.C.) signed the Chesapeake Bay Agreement in December 1983, they agreed to establish a structure to oversee the cooperative and comprehensive measures taken to restore the Bay. The Chesapeake Executive Council and its Implementation Committee (IC) began by forming the Planning, Data Management, Monitoring, and Modeling and Research Subcommittees which report to the IC. The Council's First Annual Report outlined their activities. Representatives from the three states, the District of Columbia and the six federal agencies with which EPA signed special agreements in 1984 participate on these committees.

Through the agreements, this historic partnership has been expanded and the possibilities for cooperation greatly enhanced. The resources and knowledge of the Soil Conservation Service (Agriculture), the National Oceanic and Atmospheric Administration (Commerce), Fish & Wildlife Service and U.S. Geological Survey (Interior), Corps of Engineers, and Department of Defense now have special geographic focus on the Chesapeake Bay.

In 1985 and 1986, the Council proved that the Agreement structure works to coordinate the restoration and protection of the Bay waters and living resources. We also recognized a need for additional groups.

Late in 1985, the IC formed the *Nonpoint Source Subcommittee* (NPS). It was a logical addition to the Agreement structure since the Bay Program Study concluded that much of the pollution of the Bay comes from nonpoint sources. Further, in 1984 the Executive Council adopted a policy requiring that not less than 75 percent of the Bay Program state implementation grant monies must support nonpoint source pollution control efforts.

The NPS coordinates information exchange to ensure technology transfer of the most effective urban and agricultural BMP's. It has helped the states target their programs and utilize their funding to speed adoption of land management practices. These practices reduce the sediment, nutrient, and chemical loadings to the tributaries and the Bay from areas which contribute the highest loadings.

The nonpoint source programs of the states are in place and on track. Cost-share programs are assisting farmers throughout the region to reduce soil loss, reduce nutrient loads to the Bay, and save money through decreased fertilizer use. Best management practices (BMPs) are being installed on farms. Sediment control regulations are being enforced, construction sites are being inspected, and people are being trained in construction techniques that protect water quality.

Each state funds demonstration projects showing how reduced tillage practices can prevent soil loss from agricultural lands. Public information materials are available for the farm community, construction firms, homeowners, and the general public. The resources of the Soil Conservation Service, Cooperative Extension Service, county soil and water conservation districts and state agencies are being applied to reduce nonpoint source pollution of the Bay. The chapter "Programs to Bring Back the Bay" provides more information.

Soon after the states and D.C. began implementing Bay programs, they recognized the importance of receiving the best independent scientific and technical advice available on those programs and on directions that future efforts should take. To accommodate this concern the Executive Council established the *Scientific and Technical Advisory Committee* (STAC) in December 1984. STAC reports to the Implementation Committee. It consists of 23 members who represent major universities and research institutions in the three states and D.C. as well as several federal agencies.

After reviewing the overall nutrient reduction programs throughout the Bay basin, STAC members concluded that both nitrogen and phosphorus loadings from nonpoint sources and phosphorus from point sources were being addressed. However, nitrogen from point sources was not. This was documented in data presented by EPA showing dramatic reductions in phosphorus, but essentially no reductions in nitrogen from conventional sewage treatment plants (Figure 1).

When the STAC completed its report "Nutrient Control in the Chesapeake Bay" in January 1986, it concluded that: the wastewater treatment strategy in the region should address nitrogen control; evidence exists from operating experience in nine other nations that nitrogen removal is now economically feasible; and, nitrogen removal should be considered in all plans for plant upgrading, expansion, and construction.

The report has already led to plans for expanded funding of pilot projects to remove nitrogen at sewage treatment plants and added importance to developing a Baywide dual (nitrogen and phosphorus) nutrient policy with parallel state programs. STAC has continued to examine the nutrients issue and has begun to review emerging technologies for other aspects of pollution control.

The Council also formed the *Citizens Advisory Committee* (CAC) in December 1984. Citizen participation had been an important and effective part of the Bay Program Study, and the Council wished to continue receiving the valuable perspectives of the citizens in the region.

The Citizens Advisory Committee functions as the primary public participation mechanism of the Chesapeake Bay Program. CAC is a group of 22 citizens with diverse backgrounds. They are generally well recognized in their respective fields and share a common commitment to the restoration of the Bay. Members

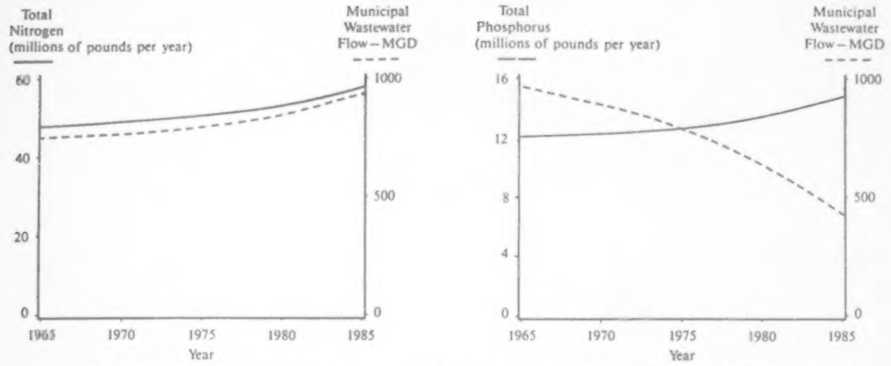


Figure 1 A and B: Annual nitrogen and phosphorus discharges and wastewater flows below the fall line and in the lower Susquehanna from municipal sewage treatment plants.

act as ombudsmen for other Bay programs, citizens, and professional groups. During 1986, the Committee elected new officers and reorganized itself into five issue oriented task forces: land use, toxic substances, nutrient policy, alternative financing, and program tracking. The task forces are providing valued policy recommendations to the Executive Council.

The CAC's research in the area of alternative finance for pollution control programs is already useful, but will become increasingly important as new tax rules and federal water quality legislation become effective. For example, under the 1986 tax code, restrictions are placed on the use of state bonds. Cost-shared nonpoint source control programs may no longer be supported with bonds because, although the funds benefit more than one person, often the money is provided to an individual to take action on private property. Therefore, the states and local government units may have to find new ways to raise and leverage monies to finance nonpoint programs. They are already faced with identifying means to continue to build and operate sewage treatment plants.

The Committee also played an important role in public information during 1986 by contributing to the development of the Council's Communications Strategy. The strategy identifies 21 constituencies important to the Bay Program effort, the important issues they need to understand, the methods to transmit those messages, the actions needed to develop the necessary information, and provision of that information. The Council requested that the Strategy be developed, recognizing the public's right to know how their state and federal dollars are being spent on Bay cleanup efforts and how well the programs are working. Creating the Strategy also reflects the Council's belief that the future of the Bay Program depends upon support from an informed and concerned citizenry.

Citizens Advisory Committee

The purpose of the Citizens Advisory Committee is threefold:

- To provide a forum where issues confronting the Council can be discussed and commented on;
- To serve as a communication link with the affected interest groups, to keep them informed about what the Council, and the agencies it represents, are doing;
- To channel relevant information about values, views, concerns, priorities, suggestions, ideas and questions from the Public to the Council.

In the spring of 1986, the Implementation Committee formed a *Living Resources Task Force*. This group is moving ahead with the development of living resources and habitat requirements for the state/federal Chesapeake Bay Program.

GOVERNANCE

During 1986, the Executive Council met four times: January 16 in Harrisburg, Pennsylvania; April 10-11 in Easton, Maryland; July 17 at the Blue Plains Wastewater Treatment Facility in the District of Columbia; and October 16 in Annapolis, Maryland. The April meeting was the first annual joint meeting of the Council with the CAC, STAC and members of the Implementation Committee.

The Executive Council reviewed its own role and membership in 1986. Members decided to retain the size and composition of the Council, but determined to begin rotating the chairmanship between EPA and a state every other year. A Governor, the Mayor or the Regional Administrator will hold the chairmanship with the Commonwealth of Virginia assuming the chairmanship in 1987.

In June, EPA Administrator Lee Thomas suggested strengthening the Bay Agreement with quantitative goals and a schedule for meeting those goals. His idea was presented at a hearing held in June 1986 by the Senate Subcommittee on Governmental Operations and the District of Columbia. As a result, the Council reviewed the Chesapeake Bay Agreement and compared its processes and progress with those of the Great Lakes Water Quality Agreement.

Members of the Executive Council concluded that progress toward quantifying and limiting loadings, as well as identifying and remedying problems in specific Bay harbors, parallel the progress and processes of the Great Lakes compact. Members look forward to the next two years as an important period to refine programs, develop target loadings, and reassess priorities under the Bay Agreement and state special initiatives.

In 1986, the Council passed two formal resolutions: one on the Farm Bill and the other on tributyltin. The Council was concerned with the U.S.

Department of Agriculture's development of new acreage set-aside regulations for wheat and feed grains under the provisions of the Commodity Program of the 1985 Farm Bill. The Council expressed concern that farmers who voluntarily took acreage out of production to reduce pollution in the Bay and its tributaries could be penalized by those lands not being eligible for inclusion in the acreage reduction program.

The Council, therefore, passed a resolution requesting the U.S. Department of Agriculture to consider, when developing new acreage reduction regulations, that Chesapeake Bay drainage basin farmers who have implemented best management practices such as filter strips, grassed waterways and forestry plantings be given credit for these lands within the cropland base. The Council also requested that provision be made for county Agricultural Stabilization and Conservation Service committees and local soil conservation district officials to review farmer applications ensuring that best management practices are implemented on set-aside acreage.

The widespread use of organotin anti-fouling paint in the Chesapeake Bay, and particularly its planned fleetwide use by the U.S. Navy and its continued use on the hulls of recreational boats sailed and berthed in Bay waters, concerned the Executive Council. The active ingredient in organotin anti-fouling paints, tributyltin (TBT), is toxic to aquatic animals at extremely low concentrations. Therefore, the Council believed that use of such paints could have long-term adverse consequences on marine life and the general environmental health of the Bay. The potential impacts dictated the need for adequate study of the matter by the Navy and by others such as EPA, prior to a decision by the Navy to use these paints fleetwide.

The Executive Council urged the Navy not to use organotin paint on ships in the Chesapeake Bay until it conducted a thorough Environmental Impact Statement or until EPA completed a study of comparable scope and detail on the potential environmental consequences of its use. The Council has subsequently supported a study that attempts to quantify the amount of tributyltin in certain areas of the Bay.

With EPA Office of Pesticide Programs (OPP), the Chesapeake Bay Liaison Office (CBLO) of EPA designed and coordinated a tributyltin (TBT) sampling study to gather data on TBT concentrations in harbors near marinas, boatyards, and living resources areas. Weekly water samples were taken at sixteen stations. Sediment samples were collected twice and tissue samples once at each station. Samples were sent to EPA's Gulf Breeze Laboratory in Florida. Results are still being analyzed and should be available in February 1987.

The OPP will consider the results during its special review of the pesticide use in antifouling boat paints. Presently, EPA is examining studies of TBT's toxicity to aquatic organisms, exposure of such organisms to TBT, and the benefits of TBT use. By comparing laboratory tests of TBT in various concentrations with actual TBT concentrations in the environment, EPA will be able to make preliminary determinations of the potential ecological hazards. In the meantime, both Virginia and Maryland are sponsoring research to test TBT's effects on some of the species found in Chesapeake Bay.

EPA Chesapeake Bay Program field intern collects samples for TBT analysis.

Improving Programs

For the past two years, agencies participating in the Bay Program have concentrated their efforts on cleaning up and restoring the Bay by correcting problems identified during the Chesapeake Bay Study using proven methods. The "Chesapeake Bay Restoration and Protection Plan," released in September 1985, outlined the agreed upon goals and the programs being implemented in the hope of reaching those goals. The data gathered and analyzed under the coordinated monitoring program eventually will show the outcome of these efforts.

However, the Council decided in 1986 that eventually will not be soon enough. We need to know how much more must be done, where, at what cost, with what results, and for how much longer. The Council concluded that to continue their long-term support, elected officials and leaders within government, industry, and public groups will need to know these answers relatively soon. To help formulate answers, a program development process was designed during 1985 and adopted in 1986. This Phase II process has four basic steps:

1. Establish water quality, living resources and habitat objectives;
2. Determine reductions in pollution loadings needed to meet the objectives;
3. Evaluate the technical alternatives and pollution control measures which could be used, according to their costs and effectiveness;
4. Suggest what should be done, where, over what period of time, at what cost, and with what expected results.

Some of the activities necessary to the process began in 1986. For example, Maryland is reevaluating its designated uses for streams in light of living resources and habitat concerns. Virginia has begun a major undertaking with its river basin citizen advisory groups to define water usages and objectives needed to support those uses. A point source atlas is being developed to identify critical pollution sources and to help prioritize necessary remedial actions.

PLANNING FOR THE FUTURE

Modeling is an essential element of planning for the Chesapeake Bay. It is an important tool for managers who need to understand the impacts of loadings on living resources and water quality. Modeling provides a simplified representation of those cause and effect relationships. One key relationship is that between nutrient loadings and low dissolved oxygen.

Although the Modeling and Research Subcommittee (MARS) was moving forward with refinement of the watershed model used during the original Study in addition to developing a steady-state water quality (2-D eutrophication) model for the Bay, the group recognized that a more sophisticated model would be required to assist in planning future programs. MARS proposed a Bay model which has three spatial dimensions – a 3-D model (time variable).

During 1986, the workplan for the 3-D model was prepared using the expertise of the Corps of Engineers' Waterways Experiment Station in Vicksburg, Mississippi. In December 1986, the Bay Program and the Army Corps of Engineers agreed to jointly fund the model over the next three years. EPA and the states will fund the water quality aspects of the project while the Corps will fund the hydrodynamic work. The Corps will coordinate the 3-D model activities under the guidance of the MARS.

The program development process will culminate in control strategies for nutrients management and toxic substances control. The control strategies will be designed to meet living resources habitat requirements. When these requirements are met, certain key species (commercially and recreationally harvestable), and the habitat vital to both their critical life stages and the sustenance of their prey species, will have conditions which should encourage their recovery and sustain healthy future populations. The Living Resources Task Force (LRTF) has developed a list of key species. The LRTF will soon sponsor a workshop that is designed to identify both water quality and habitat conditions that the key species need during their critical life stages as well as the geographic areas where those conditions need to be met.

Water quality data are being collected and analyzed under the guidance of the Monitoring Subcommittee to build the data base which will be used to model the effects of selected pollution control scenarios on the water quality of the Bay and its tributaries. Results from select runs of the model scenarios should be completed by spring 1987. The states and EPA will be able to use the results from modeling as one tool to assist them in improving the effectiveness of their present control and regulatory efforts and in planning future programs.

With water quality criteria supplemented by knowledge of living resources, habitat protection, current pollution loadings, and control techniques, use of the model will enable target loadings to be developed for tributaries and the Bay for phosphorus and nitrogen. To that end, the states, D.C., and EPA are also working with STAC to review nutrient control strategies to further define point and nonpoint contributions, and clarify the roles of phosphorus and nitrogen in the decline of water quality and living resources.

TOXIC CONTAMINANTS

The states, D.C., and EPA are moving toward developing a Baywide toxics management strategy, linking programs like biomonitoring under the National Pollutant Discharge Elimination System (NPDES) permits, assessing environmental risks from existing and abandoned hazardous waste sites, area specific studies, pretreatment, monitoring for TBT, and intensive monitoring in small watersheds for pesticides (and nutrients) in runoff and groundwater. Several projects are already underway. NOAA, in its National Status and Trends Program, is examining the long-term health impacts and levels of contamination at two benthic surveillance and six mussel watch stations in Chesapeake Bay. Under the Bay Program coordinated monitoring efforts, sediment is being collected at selected stations in the main Bay and principal tributaries and analyzed for heavy metals and organic chemicals.

Two area specific studies are underway. The Baltimore Harbor integrated environmental management study is examining how EPA's regulatory programs for air, land and water impact environmental decisions in Baltimore. In Virginia, the Virginia Water Control Board (VWCB) is developing a comprehensive management plan for the Elizabeth River. In addition, EPA in cooperation with the VWCB, is assessing the relative toxicity of effluents and water, the toxicity and environmental impacts of shipyards, and working toward the transfer of technology for marine chronic toxicity testing from EPA to the Commonwealth.

Monitoring and research on toxic contaminants are necessary to assess sources of pollutants and their impacts in order to improve present enforcement and revise NPDES permits in the future.

INTERIM REPORT

By mid-summer 1987, the information gathered and analyzed through the Phase II program development process will be summarized in an interim report. The report will contain the proposed living resources and habitat requirements. Other information to be developed for the report includes material on pollution control technologies and their costs, studies of population growth and land use change projections, preliminary review of the effectiveness of present point and nonpoint control programs, and initial economic studies of the value of the Bay. Fact gathering for the various portions of the report has begun.

The EPA Chesapeake Bay Program, the states, and D.C. plan to hold public meetings on the report following its release.

Monitoring— The State of the Bay

INTRODUCTION

This section summarizes the Second Annual Report of the Monitoring Subcommittee, "The State of the Bay," to be published early in 1987. The report covers the period from June 1984 through September 1985 which includes two summers and the intervening winter. These data are the baseline from which the success of the efforts to restore and protect Chesapeake Bay will be measured.

The years 1984 and 1985 were very different; 1984 was quite wet and 1985 quite dry. These conditions cause components of the Chesapeake to react very differently. Such differences from year to year make it difficult to distinguish natural annual variability from long-term trends in environmental quality. A monitoring strategy is being developed so that the small changes which should result from control of pollution and harvest pressures may be detected.

Both summers had periods of anoxia, but severity and duration were substantially greater in 1984, probably resulting from different frequencies and magnitudes of rainfall events as opposed to remedial actions. During anoxic periods, large pools of ammonia nitrogen and phosphorus develop in deeper waters. These pools are mixed periodically by tide and wind events, apparently feeding phytoplankton (plant plankton) in surface waters several times a summer. Extensive surveys have found oxygen-poor waters extending further into Virginia's portion of the Bay than earlier believed.

A young eagle.

Courtesy of US Fish & Wildlife Service.

Nutrient inputs to the Bay and nutrient recycling from deeper water result in phytoplankton and zooplankton (animal plankton) growth. Phytoplankton and bacteria form the base of a complicated food chain, beginning with small protozoans, progressing through larger forms such as copepods and the planktonic larval stages of barnacles and shellfish, to other plankton and fish.

In 1986, the Monitoring Subcommittee noted a few hopeful signs. At sites such as Barren Island on the east side of the Bay, submerged aquatic vegetation beds are coming back strongly, some where none had been before. This could lead to increased numbers of waterfowl in the future. While many species of birds are still in trouble, ospreys and eagles are rebounding. The striped bass controls appear to be succeeding. If the relatively strong 1982 "rockfish" year-class spawns successfully as "adults" in 1988 and water quality is adequate, overall striped bass populations may increase. State fishery teams are working together to assess the Bay's principal commercial fish stocks. They are learning how baymouth circulation may control the success of blue crab populations, one of the prime Chesapeake commercial fisheries.

Shellfish are still under severe stress, and high salinities, while conducive to better spat strike as in 1982, allow spread of diseases like MSX and dermocystidium, and predators such as the oyster drill.

In general, benthic populations have greater biomass in the lower portions of the tributaries and the lower Bay than in the deep waters of the upper Bay. Deep areas of the mainstem which become anoxic lose their benthic populations quickly. Populations along the edges of the main channel of the Bay are also stressed when wind events set the low oxygen water "rocking," allowing it to move up into these shallower areas.

In the tributaries and upper Bay most organisms are concentrated in the upper few inches of sediment. They feed primarily by sweeping up decaying plankton and runoff-borne particulates from the sediment surface. In the clearer, oxygen-rich waters of the lower Bay, large numbers of benthic organisms feed on bacteria colonizing the sediments. In turn, spot, croaker, sea trout and others feed on the benthic species. A healthy benthic community, fostered by adequate water quality conditions, is critically linked to the harvested species.

THE HARVEST: FINFISH

Harvestable anadromous fish, estuarine or marine fish that spawn in freshwater, continued to decline in numbers in 1985. Spawning remained poor, and abundance of juveniles low. However, there are hopeful signs for Bay finfish. The most important anadromous fish, the striped bass or "rockfish," appears to be benefiting from recent protective regulations, and there is optimism about the hatchery release program.

The full ban on striped bass fishing in Maryland and the partial ban in Virginia are relieving the fishing pressure on the 1982 year class, the last successful spawn from the upper Bay. Striped bass spawning in other portions of the Bay has been improving in re-

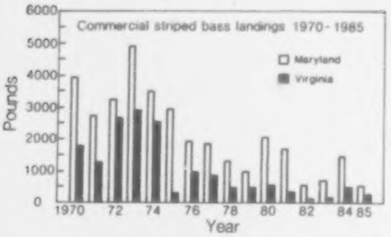


Figure 2: Commercial Striped Bass Landings. Data from NOAA National Marine Fisheries Service. 1978-1985 data are preliminary. Catches are recorded in Maryland in 1985 in spite of the moratorium due to NOAA's method of dividing total Potomac River catches between the states.

cent years. A marked increase in striped bass has been observed in Virginia since 1981, and large numbers of stripers were caught in unregulated D.C. waters in 1985.

Harvesting of striped bass was banned because of concern about the drastic declines in commercial fishery landings for both the Chesapeake and Atlantic (Figure 2). The landings reveal poor recruitment into the fishery since the 1970 year-class. The 1982 year-class of rockfish is the object of protection because it is the first year-class considered of adequate abundance since 1970. While Virginia is optimistic about the number of rockfish in its waters, recent stock assessment work has confirmed that the 1982 year-class is the only reasonably abundant one in Maryland. Data reveal very few fish older than the 1981 year-class in the Potomac, and a very low ratio of females—the egg layers on which good year-classes depend—to males. The Potomac pattern appears to be the general case for Maryland's portion of the Bay.

Maryland striped bass spawning stocks have been low; lowest in 1982 and 1983, and slightly higher in 1984 and 1985, primarily due to the protected 1982 year-class males. Striper egg and larval abundance also remained low. Intensive Maryland habitat studies, which seek to relate water quality and other habitat factors to larval abundance, are currently underway. A combination of low pH and low hardness, which tends to mobilize naturally high levels of aluminum found in some Eastern Shore rivers such as the Choptank, may be causing significant larval mortality.

There is a high natural mortality rate in the early life history stages of striped bass. The mortality rate declines considerably, however, when individuals reach the juvenile or "fingerling" (2-5 month old) stage. Juvenile or young-of-year abundance firmly establishes the strength of the newly recruited year-class, and allows projections of its contribution to the economic fishery in subsequent years. Both Virginia and Maryland survey juvenile striped bass annually. Young fish are trapped either by seine net (MD) or by seining and trawling (VA), the young stripers are counted, and the totals averaged. Due to differences in sampling techniques, the juvenile indices in Maryland and Virginia are not directly comparable.

In Maryland, year-classes with a juvenile index of 8 or greater have been considered good because historically they have apparently supported a commercial fishery of 2 million pounds of stripers annually. Since the 1970 year-class with an index of 30, however, Maryland juvenile indices have been alarmingly low. The "adequate" 1982 index of 8.4 was followed by low indices in 1983 (1.4), 1984 (4.2) and 1985 (2.9). The 1985 juvenile year-class (2.3) was only average.

Hatchery rearing may be a bridge to an improved fishery. Striped bass are now being reared in U.S. Fish & Wildlife Service and Maryland hatcheries until the fall, when they are less vulnerable and big enough to be released into the Bay. Experimental tagging and tag recovery programs were initiated in Maryland in late 1985. Their results have not yet been assessed.

Stocks of other anadromous fish such as shad, river herring, and yellow perch remain at all-time lows. Harvests of marine-spawning fish, dependent on oceanic rather than Bay conditions, are relatively good. During 1984-85, harvests of ocean spawners remained stable or increased.

THE HARVEST: SHELLFISH

With oyster reproduction, survival, and harvests declining seriously over the last decade (Figure 3), the higher spatfall in both Maryland and Virginia in 1985 was good news. Over the 1984-85 monitoring period, however, spat (newly set oysters) survival rates remained unexplainably low. No changes were noted in the dismal picture for softshell clams, but the blue crab fishery remains healthy, though unpredictable.

The significant effects of rainfall and temperature on the productivity and the health of the Bay's resources is evident when one examines the condition of the Bay's shellfish and crabs, particularly in 1984 and 1985. While there has been no long-term trend in rainfall/salinity, there has been a distinct trend toward warmer falls and winters over the last ten years. The spring of 1985, with below normal rainfall, was followed by the third warmest autumn in 30 years. The drier and warmer fall of 1985, along with higher salinities, resulted in a considerably longer spawning season than that of 1984. The oyster spawning season extended beyond the normal June-September period into late October.

As a result, both Maryland and Virginia had high spatfall. Virginia's spatfall was moderate to heavy during the 1984 and 1985 spawning seasons. The heavier spat sets generally occurred in 1985, particularly on the James River seed beds. There was considerable temporal and spatial variability in the spatfall. The occurrence of heavy spatfalls despite low brood stock underscored the importance of local weather and climate in the determination of year-class strength.

Although its 1984 spatfall continued a downward trend, Maryland found high numbers of spat on its 55 key oyster bars in 1985. The greater spatfall was welcome, but was limited mainly to the mouth of the Potomac River and Maryland's Eastern Shore tributaries. This area is greatly reduced compared with that area where high spat sets were recorded between 1938 and 1965.

The survival of spat to yearling continues to be of prime concern. In this regard, 1984 and 1985 were not exceptions. In Virginia, the statewide poor survival of spat to yearling was evident in the oyster bar surveys that followed the heavy 1985 spawning season. Predation by the blue crab may play an important role in the low survival rate and unidentified water quality factors may also be of significance.

MSX (*Haplosporidium nelsoni*) and Dermo (*Perkinsus marinus*) can pose serious disease threats to the oyster industry. Maryland's lower Bay waters experienced some Dermo mortalities and conditions conducive to MSX infestation in 1985. Mortalities resulting from the latter may be seen in 1986. Conditions in 1984 and 1985 were not conducive to the spread of pathogens in Virginia.

The stocks of Maryland's softshell clams continue to be low; 1984 and 1985 harvests were each only about 1 million pounds. Hard clam harvests are being sustained in Virginia. The crab fishery remains the one source of "good news" for the Bay's fisheries. Historically, crab harvests have fluctuated wildly yet the fishery remains unthreatened. Baywide crab harvests were 59 million and 46 million pounds in 1984 and 1985, respectively.

SAV HABITAT AND NURSERY

Submerged aquatic vegetation (SAV) has been the focus of intense Baywide study since 1978 because of its overall importance and widespread decline since the 1960s. Communities of SAV provide habitat for many species which use the plants as a food source or as protection from predators. SAV reduces currents and baffles waves, allowing materials to settle which improves water clarity. The plants bind sediments to their roots, preventing erosion of underlying material. They also absorb nitrogen and phosphorus which helps to control nutrient input to the Bay and may possibly absorb toxicants as well.

A key to the study of SAV has been the documentation of patterns of plant distribution and abundance through aerial photography and field surveys. In 1984, EPA's Chesapeake Bay Program began to coordinate a multi-agency effort to record and map SAV.

In 1985 and 1986, the program was jointly funded by the Maryland Department of Natural Resources (MDNR), EPA, U.S. Fish & Wildlife Service (F&WS), the Virginia Council on the Environment (through the Virginia Institute of Marine Sciences) and the U.S. Army Corps of Engineers. Scientific ground surveys were combined with information from aerial photographic surveys through EPA's Environmental Photographic Interpretation Center (EPIC). More groundtruth information came from fifteen charterboat captains (through MDNR's Watermen's Assistance Program) and 150 citizen volunteers organized by the F&WS, Chesapeake Bay Foundation and the Citizens Program for Chesapeake Bay, Inc.

All the information was used to produce maps for 164 topographic quadrangles throughout the Bay. Those maps indicate not only the distribution of SAV, but also the species of grasses, and the sources of the reported information.

Survey results show that between 1984 and 1985 the area covered by SAV increased 26 percent. The increase was not consistent Baywide, and total reported coverage is much less than it was in 1965. The increase may be due to dry conditions rather than pollution control efforts; still, the signs are hopeful.

The largest increase was found mid-Bay, along the Eastern Shore. There was a slight decrease in the upper Bay, and little change was observed in the distribution and abundance of SAV in the lower Bay. There has been a slight improvement in the rate of decline of migratory waterfowl numbers, especially in areas where SAV has resurged.

There was a slight decrease (4.5 percent) in the abundance of SAV in the upper Bay zone, with declines revealed in three of the four sections studied. There was a 142 percent increase in the sparsely vegetated Eastern Shore section, principally along the Elk and Sassafras rivers. All western shore rivers had SAV beds. Two-thirds of this zone's SAV was in the Susquehanna Flats area; thirteen species were reported, although the zone is dominated by wildcelery, Eurasian watermilfoil, and hydrilla. Redhead grass and widgeongrass dominate in the Eastern Shore area.

The 1985 SAV "good news" was the increase in grasses in all sections of the middle Bay zone over the previous year, resulting in a 389 percent increase for the entire zone. Even the Patuxent River, while still sparsely vegetated, showed a 401 percent increase (22 acres in 1984 to 109 acres in 1985). In the Potomac River, increases were seen in both the upper (140 percent) and the lower (59 percent) sections. Ten species of Bay grasses were found in the upper Potomac section, with Eurasian watermilfoil and hydrilla the most prevalent. Widgeongrass was found to be the dominant aquatic plant in the mainstem of the middle Bay zone. The greatest changes were in the Choptank River and in the middle section of the Eastern Shore. The Severn, South, Rhode, and West rivers had no SAV beds reported, but SAV was reported on the western shore, particularly in Herring Bay, where none had been observed in 1984.

There were no major changes in SAV in the nine sections of the lower Bay zone between 1984 and 1985. The largest change occurred in the Reedville section, where the 1985 survey revealed a decrease of 34 percent in SAV distribution from 1984. Most of the Bay's grasses (59 percent) are in the lower Bay zone, with 68 percent of this zone's vegetation located along the Eastern Shore bayside. Bay grasses are still

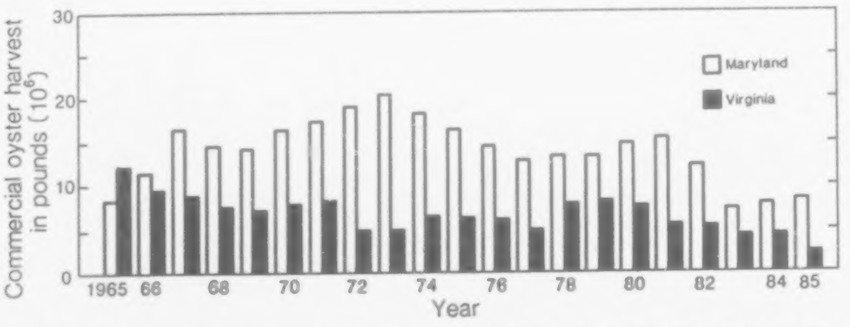


Figure 3: Commercial Oyster Harvests. Data from NOAA National Marine Fisheries Service. 1978–1985 data are preliminary.

absent in two of the six areas of historical abundance in the lower Bay. Widgeongrass and eelgrass are the dominant SAV in the lower Bay.

Healthy SAV was experimentally transplanted on the Susquehanna Flats, and in the Choptank, Piankatank and York rivers. Another encouraging sign is that these SAV beds have, in many areas, survived and propagated.

THE WATER QUALITY BASE

FLOW, SALINITY AND DISSOLVED OXYGEN

The U.S. Geological Survey has monitored the flows of major tributaries into the Bay for many years. Over the last eighteen years, the average monthly flow of the Susquehanna River at the Conowingo Dam has been 41,950 cubic feet per second (cfs). Average flows in 1984 were 19 percent above normal; in 1985 they were 27 percent below normal. There were also major seasonal differences between these two years: the 1984 summer flows were much higher than those of 1985.

River flow patterns in each tributary are unique because rainfall, topography, land use, and other factors differ among basins. In the Patuxent River, flows in 1984 were close to the long-term average (421 cfs), but 1985 flows were 50 percent below average. In the James and Rappahannock rivers, flows were 34 and 54 percent higher than normal in 1984 because of above average winter and summer discharge. Drier conditions followed with flows 20 and 35 percent below normal. In November 1985, tropical storm Juan produced heavy rainfall in western and southern Bay watersheds. The James and Potomac rivers experienced major flooding, while the storm had minimal effect on the Susquehanna.

Salinities were higher and the vertical salinity gradient (the difference between surface and bottom salinity) was less pronounced in the lower-flow summer of 1985. Surface salinities were approximately 6 parts per thousand (ppt) higher and bottom salinities about 3 ppt higher during the summer of 1985. In the Patuxent estuary, salinities were 4 to 7 ppt higher and stratification (defined layers of water) was reduced in 1985 compared to 1984. Stratification differences between the two summers are reflected in bottom water oxygen concentrations.

Dissolved oxygen (DO) levels are high for much of the year, when water temperatures are low and the water column is well mixed. In the late spring and summer, however, high oxygen demand in the sediments and the settling of organic material into the lower water column, coupled with limited downward mixing of oxygen, cause oxygen depletion in deeper waters.

Stratification has a significant influence on the DO characteristics of an estuary (Figure 5). The mixing of surface and bottom waters is inhibited as the boundary layer between the lighter, fresh water and the denser, salt water acts as a barrier to oxygen replenishment from the atmosphere to the deeper Bay waters. As the warm season progresses, biological activity depletes the amount of dissolved oxygen in the isolated, deeper water. As the amount of freshwater inflow increases, stratification tends to become more pronounced. Averaged longitudinal DO profiles for the summers of 1984 and 1985 demonstrate that high freshwater input in 1984 resulted in more extensive regions of low DO waters.

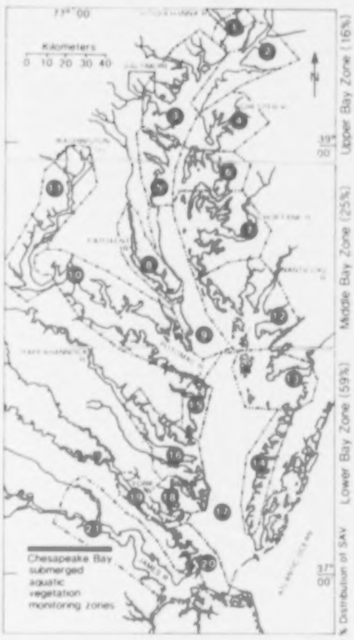


Figure 4: 1984-1985 SAV Aerial Survey Map. SAV Surveys report data according to this segmentation plan.

In the mainstem, there were several differences between the two years, especially in the spatial extent of low DO waters (DO less than 1 milligram per liter). In 1984, these hypoxic waters extended well into Virginia's portion of the Bay, reaching as far south as the mouth of the Rappahannock River. This did not happen in 1985, when wind and tides caused more frequent reoxygenation events and reduced the duration of hypoxic conditions that summer.

The summer 1984-85 monitoring results show that mainstem deep water dissolved oxygen concentrations are more dynamic than expected. Even during the summer of 1984 when the density stratification was unusually strong, two major reoxygenation events were also documented in the deep trough region of the Bay. At least two such events were documented in the summer of 1985. This means caution must be used when comparing current data with data from past years.

In the Rappahannock River, the clearly defined stratification in the summer of 1984 appeared to have effects on bottom water DO concentrations similar to those observed in the mainstem: summer DO depletion was severe and prolonged. In the Patuxent River, the effects of DO levels from the difference in stratification between the summers of 1984 and 1985 were not as clearcut as the effects on the mainstem. The observed differences between oxygen behavior in the Patuxent and in the Bay indicate that factors other than salinity stratification influence DO conditions. Topography, localized storm events, periodic exchanges with mainstem waters, and the biological impacts of nutrient loadings—conditions unique to each basin— can also affect DO concentrations.

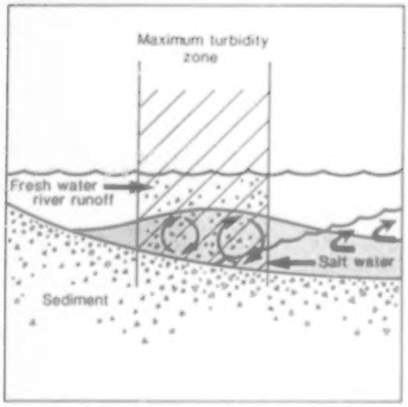


Figure 5: Stratification. Freshwater streamflow and saltwater intrusion form two wedges of water moving in opposing directions.

CHLOROPHYLL

Chlorophyll is found at the highest levels in the tidal-fresh portion of the tributaries from spring to early fall. Plankton growth follows tributary enrichment by nutrient-laden spring flows. The mainstem's highest concentrations occur in the late winter and early spring. The die-off and settling of this organic matter contribute to the spring oxygen demand in both the water column and sediments. This demand leads to the development of deep trough hypoxia/anoxia in the mainstem during the summer.

Chlorophyll patterns in the tributaries were similar in 1984-85. The highest chlorophyll levels in the tributaries were observed in the warmer seasons in tidal and freshwater; in the cooler months the higher chlorophyll levels were found near river mouths. Generally, the nutrient rich upper reaches of the Patuxent and Potomac had higher chlorophyll levels than those of the James or Rappahannock. The Patuxent had the highest concentrations of all the major tributaries.

The lower Potomac estuary experienced average chlorophyll values of 40 µg/l during spring 1985, with a peak in May over 90 µg/l. Summer 1985 chlorophyll levels peaked at 100 µg/l in the tidal-fresh reaches of both the Potomac and Patuxent rivers.

The peak chlorophyll concentrations in the tidal-fresh regions of the James and Rappahannock were 20-50 µg/l and 20-40 µg/l respectively, with levels decreasing downstream to below 10 µg/l near the river mouths. In general, the upper Bay mainstem had higher chlorophyll levels than those found in the central and lower Bay mainstem; the lowest levels were found at the mouth of the Bay. The higher upper mainstem levels are largely the result of the greater supply of nutrients from the Susquehanna River and other upper Bay sources.

Chlorophyll levels showed strong seasonal patterns with pronounced differences between mainstem surface and bottom waters. During the late winter of 1984-85 and the spring of 1985, a large region of high chlorophyll values (30-40 µg/l) was observed in bottom waters. During summer hypoxia, bottom chlorophyll was very low (under 5 µg/l). Sporadic peaks of surface phytoplankton growth (30-50 µg/l) could be seen during summer, chiefly in the central and upper Bay. In the lower Bay, near the York River, surface chlorophyll was generally low (5-15 µg/l).

NUTRIENTS

Nutrients are a major focus of the Bay restoration effort. While light, temperature, plankton grazing and mixing in the water column play roles in plant productivity, the levels of nitrogen (N) and phosphorus (P) are the key elements in undesirable Bay over-enrichment. Annual loads of total nitrogen and total phosphorus relative to mean annual flow for the past 8 years are shown in Figure 6.

Between July 1984 and September 1985, levels of total nitrogen (TN) in mainstem surface waters ranged between 1 and 2 mg/l at the head of the Bay and from 0.4 to 0.7 mg/l in the lower Bay. The higher upper Bay levels reflect the strong influence of Susquehanna River input. In summer months, bottom water concentrations of inorganic N (and P) are high, but surface water concentrations are generally low due to nutrient uptake by algae.

Values of TN were higher (at or above 2 mg/l) in the tidal-fresh regions of the Patuxent and Potomac rivers than in the upper Bay mainstem (Figure 7A). In the tidal-fresh portions of the James and Rappahannock, however, TN levels were comparable to those found at the head of the Bay. In all the tributaries, TN declined somewhat in the salinity transition zones, and declined further in the lower estuaries to levels around 0.5 mg/l.

The nitrogen enrichment found in the tidal-fresh regions of the tributaries results from both point and nonpoint source contributions. Peaks in N during winter and spring high flow periods can be attributed to high nonpoint source loads.

The pattern of total phosphorus (TP) concentrations is similar to that for nitrogen, but is not quite as clearly defined (Figure 7B). In the mainstem surface waters, TP peaked in the turbidity maximum region at about 0.05 to 0.08 mg/l and declined down-Bay to levels generally less than 0.04 mg/l.

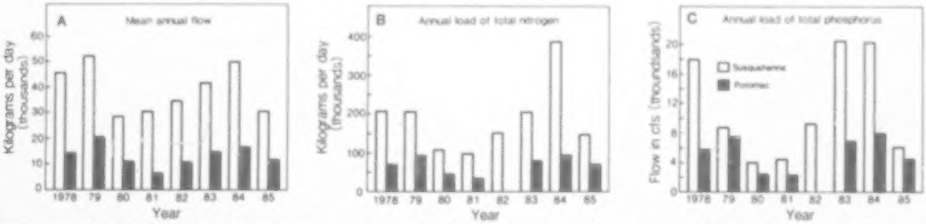


Figure 6 A, B, and C: Annual Nutrient Loads. Mean annual flow and total annual loads for nitrogen and phosphorus in the Susquehanna and Potomac rivers, showing the relationship between streamflow and nutrient loadings due to rainwater runoff.

During summer hypoxia in the deep trough region, P fluxes from the sediments into the overlying water. As with the bottom water accumulation of inorganic N, these higher P levels may nourish summer algal populations when and where vertical mixing occurs.

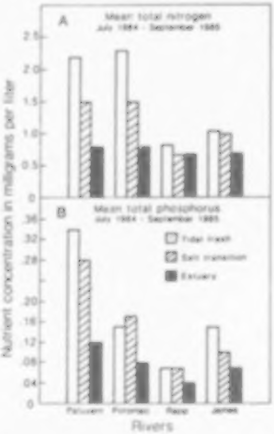


Figure 7 A and B: Tributary Nutrient Concentrations. Mean concentrations of nitrogen and phosphorus for the 1984–1985 monitoring period in selected tributaries showing general location of major nutrient concentrations.

Tributary TP levels in 1984-85 reveal differences between rivers. The Patuxent River had the highest TP levels of the four major tributaries, with concentrations in the tidal-fresh, transition, and lower estuarine zones approximately 0.30-0.35, 0.25, and 0.1 mg/l, respectively. The Potomac and James rivers had similar TP levels of approximately 0.15, 0.1-0.2, and 0.05-0.10 mg/l in tidal-fresh, transition, and estuarine reaches, respectively. The lowest TP values were found in the Rappahannock River, and were approximately 0.05-0.10, 0.05-0.10, and 0.03-0.05 mg/l, respectively. TP showed surprisingly little seasonal variation.

Together, the Susquehanna, Potomac and James rivers represent 84 percent of the freshwater flow to the Bay. The exact proportion of the total input load represented by these rivers must be determined by extrapolating monitoring data to cover unmonitored portions of the Bay watershed. Methods of extrapolation range from simple flow-based techniques to sophisticated computer models.

Based on the monitoring data, it is apparent that a simple flow-based model is not very accurate. Considering only the flow and nutrient loads for 1984 and 1985 it is clear that, of the three rivers, the Susquehanna was the major contributor of flow and nutrients to the Bay. However, of the Susquehanna, Potomac, and James rivers, the Susquehanna's nutrient loadings (66 percent TN and 42 percent TP) were not proportional to its flow (63 percent). If a simple flow-based model were used, a 21 percent overestimate would result. Factors unique to each watershed also influence the magnitude of the loads delivered to the estuary and must be considered in estimating nutrient loadings.

Still, the strong influence of river flow on nutrient loads is evident in both long-term records of annual loads and seasonal loads calculated from the 1984-85 monitoring data. In years and seasons when river flows are high, nutrient loads are also high.

SEDIMENT AND TOXIC CONTAMINANTS

SEDIMENT

Monitoring in 1984-85 confirmed a strong north to south turbidity gradient in the mainstem. Generally, turbidity is high in the upper Bay because of the Susquehanna's large flows and the turbidity maximum zone; it decreases gradually toward the mouth of the Potomac.

The maximum turbidity zone in the Bay mainstem occurs up-Bay of Baltimore near Aberdeen, Maryland. Monitoring of this area revealed typically low secchi depths (0.2 to 0.5 meters) and high total suspended solids (TSS) values (15 to 25 mg/l). Just above the Potomac's mouth, the secchi depths range from 1 to 3 meters and the TSS values from 5 to 10 mg/l.

In the central Bay, from the Potomac's mouth to the mouth of the Rappahannock, there is sometimes an increase in turbidity. Here the secchi depths in 1984-85 were between 0.9 and 2.9 meters, and the TSS values ranged from 10 to 40 mg/l. From the Rappahannock to the Bay's mouth, the waters increase in clarity. At the mouth, secchi depth readings ranged from 1 to 3 meters, and TSS values from 5 to 15 mg/l.

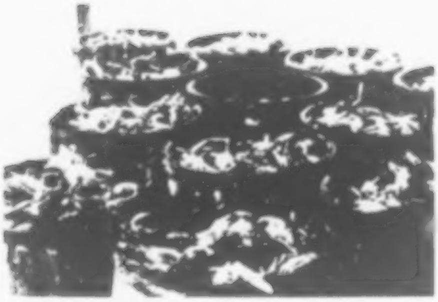
Lower Bay western shore waters are generally more turbid than those along the Eastern Shore. The earth's rotation causes relatively clear oceanic water to be deflected eastward as tidal currents move up-Bay, and substantial quantities of more turbid water are added by the discharges from western Bay tributaries. Between their turbidity maximum zones and their confluence with the Bay, the tributaries have turbidity and TSS patterns comparable to those of the Bay. Unlike the main Bay, tributaries like the Patuxent, Potomac and James have large stretches of tidal-fresh water where extensive high turbidity areas can result, not only from resuspended sediment, but also from algal blooms.

The Susquehanna's sediment loadings (an average of 1.8 million tons annually) correspond strongly with river flow and are delivered directly into the mainstem. In wetter periods, typically winter and spring, sediment loads are much higher than in the summer and fall, when flows are generally lower. The Susquehanna is unusual because several reservoirs can trap sediment and moderate loadings. The result is that the sediment contribution is often proportionately lower than its flows.

The Patuxent contributes only 0.5 percent of the Bay's freshwater flows, but its sediment loadings are proportionately higher. In the Patuxent's maximum turbidity zone (near Lower Marlboro), spring TSS peaks exceeded 80 mg/l. This high turbidity results not only from loadings, but also from the natural bottom-to-surface mixing in the water column. Secchi depths of 0.2 meters and less were observed in the 1984-85 monitoring period.

The Potomac is the second largest source of freshwater to the Bay, but it proportionately contributes the most sediment to the Bay system. An estimated 1.5 million tons are discharged at the fall line in an average year. Most of this sediment remains in the upper and mid-estuary.

The Potomac's sediment loadings in 1984 and 1985 were 22 and 126 percent higher than average. The higher figure reflects the effects of tropical storm Juan; approximately 1,134,000 tons of sediment was



The crab industry appears unthreatened.

discharged from the upper Potomac basin in November 1985.

In 1985, the average secchi disc readings for the Potomac in Washington, D.C., where algal blooms also contribute to turbidity, ranged from just over 1.1 meters down to 0.6 meters. Most of the sediment laden Anacostia River within the District of Columbia had secchi depth readings under 0.3 meters. The share of the total sediment loadings into the Bay from Virginia's James River is 16 percent. The upper reaches of both the James and Rappahannock have comparable secchi depths (0.6 m), and both show a steady decrease in turbidity from their tidal-fresh portion to their mouths. Their lower estuarine zones are markedly different. The James carries a heavier load of TSS than the Rappahannock (13.3 and 5.5 mg/l, respectively, at the fall line), and tends to remain turbid longer. The average secchi reading in the lower James ranges from 0.9 to 1.4 meters, and from 1.4 to 1.8 meters in the lower Rappahannock.

Toxic Contaminants

Of the 44 pollutants for which samples were analyzed, a total of 26 organic pollutants were detected in sediments, clams, and worms in samples collected during 1985 in Maryland waters for the coordinated monitoring efforts of the Bay Program. Polynuclear aromatic hydrocarbons (PAHs) were the most prominent organic contaminants detected, ranging from 10,000 parts per billion (ppb) in Baltimore Harbor to less than 1 ppb at the mouth of the Potomac. The majority of these PAHs were produced by combustion of carbonaceous fuels. Pesticides were detected in sediments and biota at four of the eight stations sampled. Polychlorinated biphenyls (PCBs) were found only in Baltimore Harbor sediments.

Analysis of the average concentration of the four most abundant trace metals (zinc, chromium, copper, and lead) in sediments and clams in 1985 revealed that, though high concentrations were found in sediments associated with Baltimore's industry, relationships between sediment/metal and sediment/biota concentrations were not consistent. In clams, some metals varied considerably over the course of the year. Zinc and copper tended to be higher in clams than in sediments, while lead and chromium were higher in sediments than in tissues.

Both clams and worms living in relatively sandy sediments had lower body burdens of organic chemicals than those of animals living in sediments low in sand and higher in organic carbon. Since the latter sediments had higher toxicant concentrations, especially in areas near heavy industrial activity, it appears that bioaccummulation depends on both the organic content in sediment and the grain size. In the lower Bay, Virginia sampled and examined sediments for organic chemicals at eight stations. Virginia scans samples for a wide range of hydrocarbon toxicants. Hundreds of compounds were detected in some samples. As in the upper Bay, PAHs were most abundant, but were not excessively high.

The spatial distribution of concentrations appears to reflect both the particle size distribution of the sediments and toxicant input from rivers. Coarse-grained sediments found near the mouth of the Bay contained low PAH levels. The PAH concentrations were generally higher near river mouths than in the mainstem.

Drawing conclusions for the lower Bay based on a comparison of 1979 and 1984-85 sampling is difficult because the sampling stations were not identical and there are too few stations for an area the size of the lower Bay. However:

- The 1984-85 samples show increases in overall toxicant concentrations since 1979;
- There is a slight but insignificant decrease in total concentrations in 1985 from 1984;
- At Hampton Roads, total PAHs increased fourfold from 1984 to 1985 possibly reflecting decreased sediment particle size with a concomitant increase in toxicant adsorption.

The National Oceanic and Atmospheric Administration (NOAA) studies the bioaccumulation of toxics in coastal regions nationwide. In the Bay, NOAA focuses on contaminants in sediments, Atlantic croaker livers, and oysters.

General use of the pesticide DDT declined significantly during the late 1960s and was banned in 1972. Analysis of historical data reflects this decline. Oyster body burdens of DDT and its metabolites decreased steadily from 1965 to 1977. Results also indicate that DDT concentrations (in sediments) are highly correlated with liver concentrations for Bay Atlantic croaker, which eat benthic animals. Studies elsewhere have associated sediment containing PAHs with the occurrence of cancer in fish. Although cancerous lesions were not found in Bay croaker and spot, occurrences of other types of lesions were correlated with concentrations of total PAHs in sediment.

Sample sites in the upper Bay yielded consistently higher levels of metals in oyster tissue than sites in the lower and central Bay. The relative roles of contamination and natural processes have not been determined.

Plankton and the Food Chain

The Bay is one of the most productive estuaries in the world. The plankton form the base of this productive food chain. In order to understand the food chain foundation, a new cooperative Baywide program for plankton and benthic monitoring began in 1984-85. Plankton were sampled at 23 Bay stations simultaneous with the collection of water quality data. Phytoplankton activity is greatest in the fresh-

Fish egg and larvae survey underway aboard the University of Maryland research vessel "Orion."
Photographer: Kent Mountford

water and transition zones (0.5 – 5.0 ppt) of the Bay and its tributaries where there are high nutrient concentrations. Benthic samples were also collected at 86 stations.

Maryland's 12-month sampling revealed high productivity in the upper freshwater portions of the Patuxent and the Potomac; the highest productivity was found near the Chesapeake Bay Bridge where salinity ranges from 5–18 ppt. The upper two freshwater and transition stations in the mainstem of the Bay showed the lowest productivity. These stations are located at the mouth of the Susquehanna, where high productivity was inhibited by high turbidity.

The seasonal pattern of phytoplankton growth in 1984–85 was typical: high late summer productivity due to long days and warm water; a fall peak followed by low winter productivity; and a major spring peak following an influx of nutrients with the spring freshwater inflows.

Productivity and seasonal patterns in the Potomac and Patuxent were similar. The Patuxent, however, had higher and more frequent peaks of productivity. Patuxent River carbon fixation rates (a measure of organic production) were 40 percent higher than Bay rates, and chlorophyll *a* values (a measure of biomass) were 50 to 200 percent higher.

In terms of composition, diatoms were dominant during the late winter/spring and fall blooms. Small coccoid green cells were numerically dominant in the Maryland part of the Bay the rest of the year. During 1984-85, large quantities of phytoplankton settled into deeper Bay waters where their decomposition further depleted oxygen levels in bottom water.

Virginia plankton sampling of the mainstem was limited to July-September in 1985. The data indicate diverse population patterns with distinct differences in phytoplankton composition and concentrations between the central and lower Bay, significantly greater abundances and diversity in the deeper water layer, and a greater diversity and concentration of species near the Bay's mouth.

During 1984–85, microzooplankton were sampled in Maryland's portion of the Bay, and mesozooplankton were sampled in both states' waters. As with phytoplankton, higher biomass was found in the upper freshwater and transition zones. Maryland sampling revealed nothing surprising: shrimp-like crustacean copepods were the dominant zooplankton. In Virginia's lower Bay, isolated and unexpected high concentrations of copepods were found.

Zooplankton seasonal peaks occurred. Coupled with phytoplankton growth, there were spring and fall peaks which were more pronounced in less saline waters. Monitoring results support the concept of "coupling" between phytoplankton and zooplankton; the seasonal microzooplankton peaks coincided with the phytoplankton peaks or followed them by one month; mesozooplankton peaks coincided with the phytoplankton peaks during the spring bloom, but at other times aligned more closely with microzooplankton abundance. This phenomenon also suggests an important link between phytoplankton and the larger mesozooplankton in the food chain during much of the year.

Over the last several decades, the duration and extent of low DO in Bay bottom waters during summer months have increased. With decreasing oxygen levels, the abundance of short-lived benthic species that are less suitable prey for finfish and crabs has increased, while the availability of preferred longer-lived benthic species has decreased. Lower standing stocks and abundance of benthic biomass were found in the deepwater mud habitats where summer hypoxia/anoxia occurs.

The deep central portion of the Bay in Maryland, the lower half of the Potomac River, and the upper Bay in Virginia support the lowest benthic biomass; the greatest benthic biomass is found in the brackish and low salinity habitats. A summary of the more notable findings from the 1984–85 benthic sampling follow:

- Effects of anoxia are most apparent in deep waters just downstream from the Bay Bridge where anoxia is generally most severe. Stress from hypoxia/anoxia also appears to have affected benthic communities at two Virginia stations: in the deepwater mainstem and in the lower Rappahannock;
- Areas not experiencing anoxia confirm that year-to-year fluctuations in salinity are a major factor influencing long-term benthic trends;
- In the Patuxent River, populations of a clam (*Macoma baithica*) dependent on organic-rich sediment deposits have declined since 1980. In this situation, using *M. balthica* as an indicator of carbon in the sediment, a decrease in population is considered to be a positive sign. This suggests that secondary sewage treatment and sediment controls are having a beneficial effect.

Programs to Bring Back the Bay

PROGRESS OF STATE PROGRAMS

PENNSYLVANIA

Pennsylvania's Chesapeake Bay Program is based on the premise that solving the Bay's problems will ultimately benefit the Commonwealth's farmers. Soil loss from Susquehanna River basin croplands exceeds the state average of 5.5 tons per acre per year by 34 percent. Helping farmers to adopt practices to keep soil and nutrients on farmlands and out of the streams will help to maintain soil productivity and improve farm economics.

The state's Departments of Environmental Resources (DER) and Agriculture, Cooperative Extension Service, conservation districts, the federal Soil Conservation Service (SCS), the Agricultural Stabilization and Conservation Service (ASCS) and many volunteers, in cooperation with farm organization programs, are helping farmers improve their land management. County conservation districts administer DER's cost share program with oversight provided by the State Conservation Commission. In 1985, the Commission established a Chesapeake Bay Advisory Committee which provides Bay-related recommendations and support to education efforts. Additionally, in 1986, Pennsylvania joined the Chesapeake Bay Commission.

NONPOINT SOURCE POLLUTION CONTROL PROGRAM

The Commonwealth of Pennsylvania continued to concentrate on the development and implementation of a comprehensive, four-part agricultural nonpoint source pollution control program in FY86 with a commitment of $4.35 million, half of which is EPA Bay implementation grant funding. (Total financial commitments in Pennsylvania since 1984 approach $10 million.) The four-part program includes: planning, education, financial assistance, and technical assistance.

Educational activities are conducted to provide information to landowners and the public to foster understanding of the need for nutrient management, erosion control and water quality improvement. The Pennsylvania Association of Conservation District Directors, Inc. assists DER in coordinating educational activities.

Demonstration projects continue to play a major role in the education program. Efforts focus on analysis of soil, manure, and the movement of nutrients through the soil profile. The mobile nutrient laboratory is a particularly effective educational tool to reach farmers. Farmers are provided on-farm analysis of soil, manure, and water to encourage them to adopt best management practices (BMPs) as part of a nutrient management program.

Several other projects focus on increasing the use of reduced tillage and spreading manure on woodlands. Projects involving alternative use and handling of pesticides are in progress. Several crop management associations have recently been formed and are proving to be a useful means of information transfer to farmers.

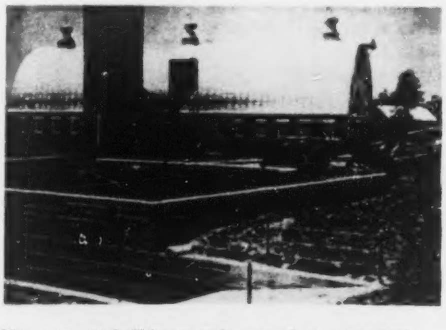
To accelerate the installation of BMPs, technical assistance is provided for the planning, design, layout, and installation of BMPs on farms in targeted areas within the Susquehanna River Basin. Technical assistance is also provided to local water suppliers to promote water conservation.

Contracts were signed by farmers in the high priority watersheds to implement nutrient management and soil conservation practices. To date, 103 contracts have been signed to implement BMPs and complete nutrient management programs over a multiyear period. This represents a small part of the total of $2.8 million in financial assistance available to this program. After agreeing to implement a nutrient management plan, farmers are eligible to receive as much as 80 percent cost-sharing for BMPs, to a maximum of $30,000.

POINT SOURCE TOXICS CONTROL STRATEGY

DER continued to implement its Point Source Toxics Control Strategy to address EPA's priority pollutants and other toxicants through its federally delegated NPDES Permit Program.

The Departments of Environmental Resources and Health and the Fish Commission conducted a special statewide PCB sampling study in 1985. The study found that fish contaminated above Food and Drug Administration (FDA) recommended levels were primarily bottom dwellers that feed on material found



Manure storage facilities are an important best management practice to reduce nutrient runoff.

in the sediment. Most sport fish sampled did not show levels of contamination above FDA recommendations, if at all, in edible tissues.

SEWAGE TREATMENT PLANT PROGRAMS

The Commonwealth's Environmental Quality Board approved a package of regulations in March 1985 to enable Pennsylvania to apply for delegation of EPA's Pretreatment Program; delegation is anticipated in FY87. In the meantime, DER continued to assist EPA in carrying out the program in Pennsylvania. Of 35 municipal treatment programs, 33 have approved programs.

In February 1986, Pennsylvania initiated the development of a comprehensive rural sewage management project in the Village of Millmont, Union County. This is the second such project developed by Pennsylvania to research and evaluate alternative and innovative technologies for sewage disposal.

FISHERIES PROGRAMS

The program to restore American shad to the Susquehanna River has shown significant progress. For the period from 1972 through 1985, a total of 5,400 American shad were captured at the Conowingo Pool fish trap for possible transportation upstream for spawning. In the spring of 1986, 5,193 shad were captured. Of this number, 4,200 were transported upstream for spawning in the Susquehanna River near Harrisburg.

GROUND WATER PROGRAM

Development and implementation of a comprehensive Ground Water Quality Management Program continued. As a pilot project, three ambient ground water quality monitoring systems were established within high priority ground water basins in Pennsylvania. This enabled DER to assess the effectiveness of this method of monitoring before finalizing its Ground Water Monitoring Strategy. DER is now proceeding to implement the monitoring program.

Pennsylvania received final program authorization (primacy) from EPA in January 1986 to carry out a federally-delegated Resource Recovery and Conservation Act (RCRA) Program.

Activated sludge treatment at the 299 MGD Blue Plains wastewater treatment facility.
Courtesy of District of Columbia Department of Public Works.

DISTRICT OF COLUMBIA

The goal of the District's Bay Program is to improve water quality in the Potomac and Anacostia rivers, thereby promoting and protecting the living resources in those waters and the Bay.

The Bay cleanup efforts within the District are shared between the Departments of Public Works (DPW) and Consumer and Regulatory Affairs (DCRA). DPW designs and constructs demonstration projects and continues to operate and upgrade the Blue Plains Wastewater Treatment Plant. DCRA develops, implements and enforces construction erosion regulations and other nonpoint source control efforts. The agencies share development and distribution of public information which occurs as an integral part of their programs.

COMBINED SEWER OVERFLOW (CSO) ABATEMENT PROGRAM

Because of the age and design of the District's sewer system, large quantities of raw sewage mix with rainwater during periods of heavy precipitation. While many provisions are made to reduce overflows, substantial volumes of sewage are discharged directly to the Anacostia, Rock Creek, and Potomac rivers. Through the CSO Abatement Program, discharges of combined sewage will be controlled by structural changes. DPW will construct inflatable weirs (dams) to hold stormwater until it can be transported to the Blue Plains Wastewater Treatment Plant for treatment. Swirl concentrators will be constructed to treat wastewater by centrifugal action before it is discharged to the Anacostia. Once operational, swirls are expected to reduce the annual overflow volume and the frequency of overflows in the Anacostia River by 50 percent.

PRETREATMENT PROGRAM

In 1985, the Council of the District of Columbia enacted the Wastewater Systems Amendment Act. In June 1986, the Department of Public Works promulgated rules and regulations which direct the pretreatment program, enabling the District to monitor toxic compounds identified by EPA. Regulations for compost use, discharge permits, wastewater treatment facility construction, and water quality management are in various stages of promulgation.

BLUE PLAINS SEWAGE TREATMENT PLANT

In 1985, Blue Plains treated 299 million gallons per day (MGD) of wastewater from Maryland and Virginia counties as well as the District. Blue Plains is the largest advanced wastewater treatment plant in the United States. Processes utilized for treatment include secondary treatment, nitrification, and phosphorus removal. Blue Plains has been performing better than required in the removal of phosphorus from the waste stream. Regional users and EPA will invest an estimated $100 million to expand treatment capacity to 370 MGD. The District will add another $50 million.

About 1,300 pounds of chlorine is discharged daily from Blue Plains. Though an excellent disinfectant, chlorine is toxic to many aquatic organisms. To protect living resources in the Potomac and the Bay, DPW has begun constructing dechlorination facilities at Blue Plains to be completed in 1988.

PHOSPHATE BAN

The District's phosphate ban became effective in September 1986. However, since January 1986, Blue Plains officials have witnessed a 26 percent decrease of influent phosphorus concentrations compared with the 1985 load. They attribute the majority of the decrease to Maryland's phosphate ban. Because distributors of detergents operate regionally, phosphate products were removed from store shelves in D.C. well as Maryland after Maryland's ban began in December 1985. Once both bans are fully operational, the influent phosphorus concentrations to Blue Plains are expected to be reduced by 30 percent.

The Bay Program estimates that Blue Plains will experience a 15 percent savings in operating costs. The Bay Program estimates that annually an estimated $29 million could be saved from a Baywide phosphate ban due to a decrease in chemical usage and reduced sludge disposal costs.

STORMWATER MANAGEMENT

DCRA's Stormwater Management Program became fully staffed in February 1986. Stormwater management regulations have been drafted to implement DC Law 2-23, the Soil Erosion and Sedimentation Control Act, and are in review. The new regulations will require developers to contain runoff on construction sites and release it at or below pre-development rates. The Stormwater Management Program also issues a number of guides to inform citizens on how they can control pollution.

EPA's Chesapeake Bay Program emphasis on nonpoint pollution control and its grants has enhanced the programs of the DC Soil and Water Conservation District (SWCD). The DC SWCD hosted the Fifth Annual Erosion and Sedimentation Control Program Administrators Conference to discuss government programs at all levels as well as private sector initiatives. The DC SWCD also sponsors high school education programs and awards.

FISHERIES MANAGEMENT PROGRAM

The new Fisheries Program began participating in NOAA's Stock Assessment by inventorying the anadromous fish in the District. A recreational fishing survey was conducted to establish baseline information. Draft regulations to manage anadromous and resident fish populations were published. Following review of the license fee schedule, promulgation will be completed.

Virginia's rainfall simulator is used to demonstrate the effectiveness of conservation tillage practices in reducing erosion.
Photographer: Anne Weinberg.

VIRGINIA

Virginia's Chesapeake Bay Initiative Program includes 30 initiatives in nine agencies of five different secretariats. Virginia's commitment for Chesapeake Bay Initiatives has totalled $58,851,193 to date. (Of this total, $8,004,954 is from EPA grants.) This includes $14,937,604 for projects during the 1984–86 biennium and $43,913,589 for 1986–88. Of the funds allocated for 1986–88, $20,400,000 is for sewage treatment plants. Overall program coordination and tracking is provided by the Council on the Environment.

POLLUTION ABATEMENT

Virginia concentrates its Chesapeake Bay efforts on a variety of programs designed to reduce the quantity of pollutants entering the Bay and its tributary waters.

FARMS. Pollutant-carrying runoff from agricultural land is being reduced through a combination of education and cost-sharing grants designed to encourage farmers to improve their land management. So far, 1,444 farmers have installed BMPs on 58,594 acres as a direct result of state cost-sharing funds. This has resulted in 333,930 tons of sediment which otherwise would have eroded from farm fields each year. This also has reduced the sediment load to streams and rivers by approximately 31,260 tons and phosphorus carried by soil particles by 33,760 pounds. Another 51 farmers are installing facilities to manage 114,407 tons of animal waste each year from their livestock operations.

The education component of Virginia's program demonstrates the value of using BMPs and convinces farmers to install BMPs voluntarily. One of the best means of demonstrating the value of BMPs in a clear, convincing way is through the rainfall simulator, which reproduces the effect of a typical summer cloudburst. It is set up over two side-by-side farm plots, one of which has been conventionally tilled, the other using no-till. A demonstration in Essex County showed that the no-till plot produced half the total runoff, one-tenth of the sediment and phosphorus loss, and one-fourth the nitrogen loss, in comparison with the conventional plot.

URBAN AREAS. The use of urban BMPs is being encouraged through cost-sharing and technical assistance. Eleven projects in seven localities include porous asphalt pavement, an infiltration trench and grassed waterway, streambank stabilization, an "urban marsh," and a "wet pond" (manmade rainwater detention basin). Monitoring at the wet pond site indicates that the pond is effective in removing up to 87 percent of the silt and 80 percent of the phosphorus from the runoff. It also removes up to 65 percent of the lead and zinc. While this wet pond project is relatively small, its efficiency at pollutant removal is significant. It and other projects serve to demonstrate the urban BMP concepts and promote voluntary use of similar practices in other urban areas.

SEWAGE TREATMENT PLANTS. Other significant sources of nutrients are the 476 municipal sewage treatments plants (STP) in the Virginia portion of the Chesapeake Bay basin. Virginia has become directly involved in the financing of municipal STPs. The newly created Virginia Water Facilities Revolving Fund makes construction loans available to localities at low interest rates. Limited grant funds are also available.

The Virginia Resources Authority was created to provide low-interest financing alternatives to localities. Three bond issues have financed a total of $63,620,000.

Another initiative concerns the correction of faulty sewer lines. Forty infiltration and inflow problem areas exist in the Virginia Bay basin. Eliminating them should result in significant reductions in the number of occasions when rainfall causes STP overflows and discharges of untreated sewage into the Bay and its tributaries. Four projects are currently underway with another six planned for FY87. The Commonwealth has also instituted a pilot nutrient removal program in three localities. Preliminary results from the York River STP biological nutrient removal process indicate that the level of phosphorus discharged has been reduced about 80 percent—from 8 mg/l to less than 1 mg/l.

The State has made significant strides in reissuing discharge permits so that the limitations imposed on treatment plants remain current. In addition, a State standard for chlorine has been adopted, and efforts are underway to develop nutrient standards and toxicity reduction strategies.

LIVING RESOURCES AND HABITAT IMPROVEMENT

A number of Virginia's initiatives affect habitat in the Bay and its tributary waters, and complement on-going programs such as the management of tidal wetlands and subaqueous lands.

CHLORINE REMOVAL OR REDUCTION. One effort is directed towards reducing the amount of chlorine used and discharged by sewage treatment plants. Ten localities have been awarded grants totaling $1.8 million for either dechlorination or alternative disinfection at their sewage treatment plants. Another $1.7 million has been allocated for future projects. Prior to the Bay cleanup effort, 6,670 lbs of chlorine were being discharged each day; this amount will be reduced to 3,905 lbs per day. Because many of the localities reducing or eliminating chlorine in STP discharges are adjacent to spawning and nursery areas, an increase in fishery populations is anticipated as the young marine organisms are able to reach maturity.

FINFISH. Fishery management plans set goals, objectives and strategies for increasing stock, improving habitat, managing harvest, and ensuring the proper collection of fisheries data. The first plans to be developed are for striped bass and oysters.

SUBMERGED AQUATIC VEGETATION. An experimental program was started to reestablish SAV beds and determine what causes their decline. Thirty acres of eelgrass were transplanted in the first two years of the program with survival rates ranging from moderate to poor. Losses are attributed to winter ice scour, turbidity, accidental dredging, cownose ray and crab uprootings, and other biological factors under investigation. Still, growth in some areas has been phenomenal; at one site, each transplanted plug has proliferated by an average of 100 times. Efforts to reestablish SAV beds, including seed planting, are continuing.

SHELLFISH GROUNDS. While maintaining its commitment to protect the public from contaminated seafood, the State is also working to reopen condemned shellfish grounds by correcting the causes of the contamination.

To date, 3,740 acres of productive shellfish grounds have been reopened, making $1,288,288 in shellfish available to commercial harvesting during the first harvest year. These areas should continue to produce shellfish valued at about half this amount in each subsequent year. The cost to the State has been $115,016 for an overall benefit/cost ratio of about 11 to 1.

OYSTER ROCK REPLETION. Another initiative added $1,000,000, an increase of 50 percent, to the oyster repletion program. As a result, the Marine Resources Commission was able to plant approximately 3.8 million bushels of shell and 66,500 bushels of seed oysters by the end of 1986. There are plans to plant another 2 million bushels of shell in each year of the 1986-88 biennium as well as to develop alternative methods of supplying shell for repletion.

OYSTER HATCHERY. In 1985, VIMS began the operation of an oyster hatchery which will in future years help to ensure availability of seed oysters for both remote setting by oystermen and for scientific research. To date, 221 million oyster larvae have been raised for in-house research and use by industry.

RESEARCH

Numerous research projects are on-going, including the analysis of water quality and living resource monitoring data. The findings of these studies are coordinated and shared throughout the State and Bay region.

Technicians use high power water guns to plant oyster shells for improved oyster habitat.

Courtesy of Maryland Department of Natural Resources.

MARYLAND

Since signing the Chesapeake Bay Agreement, the State of Maryland has allocated over $130 million to support 35 Bay initiatives. Over 1,700 BMP projects are being installed with 3,000 applications pending, and there has been substantial improvement in industrial and municipal compliance.

In Maryland, a number of different agencies are involved in Bay cleanup: the Department of Natural Resources, the Department of Agriculture, and the Office of Environmental Programs. In addition, a number of councils and commissions have been established to carry out specific tasks, such as the Critical Areas Commission and the Governor's Council on the Bay.

DEPARTMENT OF NATURAL RESOURCES PROGRAMS (DNR)

The DNR implements resource restoration and management activities focused on finfish, shellfish, SAV, land use, erosion and stormwater management, recreation/conservation, and education.

Using $50,000 in State General Funds, the DNR selected 18 locations for SAV transplanting demonstration projects. Preliminary results are encouraging.

In order to ameliorate dwindling oyster harvests, in 1985 DNR planted dredged oyster shells, fresh oyster shells and oyster seeds on 565 acres at a cost of about $505,000. In 1986 about 5.6 million bushels of dredged shell, 461,000 bushels of fresh shell, and 315,000 bushels of oyster seed were planted at a cost of about $2 million.

Maryland is also involved in a joint DNR, Fish & Wildlife Service (F&WS) striped bass stocking and tagging program, releasing about 200,000 tagged fish in 1985.

In the land use arena, the Chesapeake Bay Critical Areas Commission is Maryland's major achievement. The Commission set up criteria and guidelines to assist local governments to regulate growth and development within the 1,000 foot "critical area" zone surrounding the Bay and its tributaries.

Non-tidal wetland activities focused on completing the digitization of the F&WS National Wetland Inventory Maps for the western shore in FY86. Other actions included reviewing projects for potential impact on non-tidal wetlands and implementing the initial phases of a wetland assessment and monitoring system.

In FY85 and 86, the Maryland Environmental Trust negotiated conservation easements on 2,470 acres (8 miles of shoreline) and reduced the permissible population density on these easements from 1 dwelling unit per 5 acres to 1 unit per 55 acres. DNR awarded over $1.46 million in State General Funds for stormwater management grants-in-aid funds during FY86. This brings the total expenditure of the program to $2.64 million. In efforts to retain existing forestland, four Bay watershed foresters prepared 93 forest management plans for 7,878 acres within the critical area. In addition, sediment control plans on 3,471 acres were prepared, development site reviews were performed on 2,864 acres, and 124 acres of trees were planted along two miles of shoreline.

Supporting the freshwater conservation initiatives, DNR staff provided technical assistance for the establishment and maintenance of water conservation programs in several counties.

DNR contracted with the Interstate Commission on the Potomac River basin for a study to analyze operation rules for reservoirs in the Potomac River basin to determine if it is possible to increase freshwater inflows to Chesapeake Bay during low flow periods. Up to 10,000 acre-feet of water may be available without significantly affecting water supply, flood control, and water quality purposes of upstream reservoirs. Up to 100,000 acre-feet of additional storage may be available in reservoirs in the Susquehanna River basin.

DNR receives an annual appropriation of $500,000 designated specifically for research. To date, nine projects have been funded, including stormwater management, nutrient modeling, resource management and toxic substances.

To demonstrate the effectiveness of stormwater BMPs in reducing pollution, and as an incentive to local governments to undertake similar projects, the OEP administers a cost-share effort to help local governments implement stormwater runoff controls. Six projects are now underway.

Shore erosion control demonstration projects have been undertaken to protect 8,895 linear feet of shoreline at a cost of $20–$80/foot ($250,000 Md/$345,000 EPA). For privately owned lands, a total of 21 matching grant projects have been selected for shoreline stabilization. These projects incorporate a total of 6,158 linear feet of shoreline protected at an average cost of $53/foot ($327,283 MD).

DEPARTMENT OF AGRICULTURE PROGRAMS

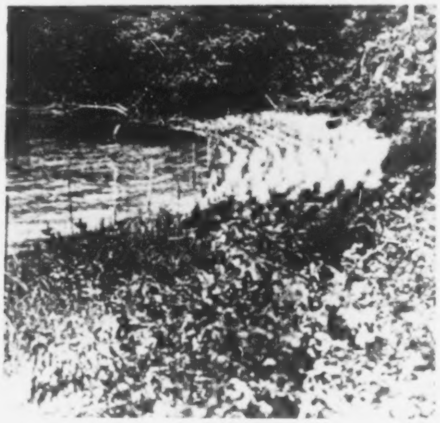
The Department of Agriculture's efforts in Bay cleanup focus on assisting in the implementation of best management practices. The Department created 17 new positions in FY86. That expansion enabled completion of 952 soil and water conservation plans in FY86. The Department was authorized $5 million of state funds and received $1 million in EPA funds for agricultural cost-sharing. More than 3,000 farmers have applied for funds to implement best management practices.

Since 1983, in the agricultural nonpoint area, over 1,700 projects have been completed at a cost of $4 million. The goal is to have conservation plans on all farms in Maryland's priority watersheds by 1989 and on every farm in the State by 1994.

Outreach and education activities continued to encourage better land management and implementation of BMPs. In addition, the Department formally adopted regulations to govern the design, construction, operation, and maintenance of agricultural drainage projects.

PROGRAMS—THE OFFICE OF ENVIRONMENTAL PROGRAMS

The Office of Environmental Programs (OEP) within Maryland Department of Health and Mental Hygiene manages programs under authorities delegated by state and federal laws and regulations. OEP is responsible for implementing programs related to point and nonpoint water pollution, air pollution, safe drinking



Grasses are planted on exposed shoreline as a nonstructural erosion control practice.

Courtesy of Maryland Department of Natural Resources.

water, toxic substances, hazardous wastes, and community health.

The OEP's point source control programs have shifted from study and planning to construction and implementation. Every sewage treatment plant (STP) in the State has been affected; with the completion of the Havre de Grace plant's upgrade in late 1986, all major plants in the State have achieved secondary or advanced treatment capabilities. This translates to a 40 percent improvement in the plants' ability to remove conventional pollutants.

Phosphorus removal technology is now on line at 17 STPs throughout the State. At 120 of the 150 STPs in the state, chlorine is being removed. Nitrogen removal capability, now being initiated at two Patuxent River facilities with an additional two to come, will help to determine the cost and effectiveness of nitrogen removal processes in the Patuxent basin. The results will indicate whether nitrogen removal should be implemented at treatment plants throughout the Bay basin. As a result of implementing pretreatment in Baltimore City, there have been significant reductions in heavy metals. In addition, the State now considers the Back River Treatment Plant sludge to be clean enough for on land disposal.

In 1986, the Waste Management Administration more than doubled the number of enforcement actions it took against noncomplying industries over the number of 1985 cases; from 39 to over 80. The compliance rate of the 163 publicly owned treatment works increased from 39 percent in 1983 to an estimated 60 percent in 1986.

OEP is funding two major research projects: a Patuxent River model and an investigation of carbon cycling processes in Chesapeake Bay. The Patuxent River Water Quality Model will evaluate the interactions of numerous conditions within the Patuxent ecosystem. It will provide managers with a tool for predicting the effects of various nutrient control strategies.

The project on carbon cycling is investigating plankton populations in relation to the processes of carbon and oxygen cycling. The study also focuses on how algal blooms affect benthic oxygen demand. The research will provide answers to questions about how carbon cycling and deposition contribute to anoxia in the Bay.

PROGRESS OF FEDERAL PROGRAMS

DEPARTMENT OF DEFENSE

With the signing of the Joint Resolution on Pollution Abatement with the EPA in 1984, the Department of Defense (DoD) pledged to give priority consideration to funding pollution control projects and studies which would enhance the Bay's quality.

Two major ongoing studies were initiated in the fall of 1985. The first is a three part study to determine the relative impact of DoD activities on the water quality and living resources of the Bay and its tributaries. Phase I of this study screened 66 DoD installations to identify existing and potential water quality impacts. Current efforts are concentrating on 37 installations which have been identified as needing further study. The second study is a pilot program to enhance the operation of wastewater treatment facilities. Demonstration projects are now being conducted.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

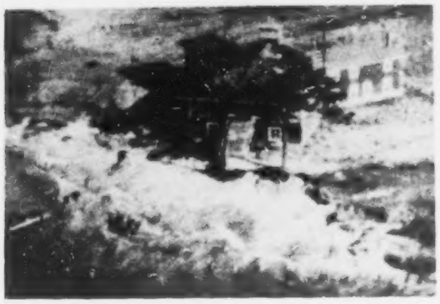
NOAA's involvement in the cleanup of the Chesapeake Bay is focused primarily on the restoration of living resources. In FY85, NOAA signed a Memorandum of Understanding with the EPA, established a new Estuarine Programs Office (EPO) responsible for the coordination of NOAA activities within the Chesapeake Bay Program, developed a NOAA Chesapeake Bay Study Plan, sponsored and coordinated a number of Bay research related seminars, and continued active involvement of its offices in the Chesapeake Bay area. In sum, NOAA spent about $5 million in Chesapeake Bay during FY85.

A federal/state/academia Chesapeake Bay Stock Assessment Committee (CBSAC) has been formed, at NOAA's suggestion, to determine the effects of climate, fishing pressure, and contaminants on fishery stocks. CBSAC has established a framework for its activities and funded initial research to improve fishery statistics and stock assessments.

During 1985, Maryland and Virginia Sea Grant researchers examined the cause and dynamics of oxygen depleted Bay waters. Researchers are also examining the effects of low dissolved oxygen bottom waters on the Bay's living resources.

NOAA's National Marine Fisheries Service (NMFS) is examining the etiology of diseases in such Chesapeake Bay species as the soft clam (*Mya arenaria*), menhaden, shad, and river herring. It coordinates with and assists the Mid-Atlantic Fishery Management Council and the various fishery commissions dealing with Chesapeake Bay in the development of their Fishery Management Plans. NMFS also publishes annual commercial and recreational fishery statistics of Chesapeake Bay.

NOAA's National Ocean Survey (NOS) produces nautical charts, tide and current tables, atlases and catalogues, detailed field surveys, and coordinates coastal resource management through grants to states and a National Estuarine Research Reserve Program. Along these lines NOS is developing a National Estuarine Inventory Atlas (delineating some of the



Shoreline erosion can have costly and devasting effects.
Courtesy of the US Army Corps of Engineers

physical characteristics of 185 estuaries) and a National Coastal Pollutant Discharge Inventory. Both include Chesapeake Bay. Ultimately these data will be used in the water quality models being developed by the Chesapeake Bay Program.

In FY85, Maryland, Virginia, and Pennsylvania received NOAA funds (under Section 309 of the Coastal Zone Management Act) to coordinate interstate coastal management programs. Maryland is assessing habitat quality in spawning areas and studying habitat quality and circulation in the Eastern Bay; Virginia is examining nutrient loads, fishery statistics, and improved data management; and Pennsylvania has applied its grant toward the assessment of toxics in surface waters and collection of nutrient and sediment runoff data.

NOAA's National Environmental Satellite Data and Information Service (NESDIS), with the Virginia Institute of Marine Science, produces a quarterly and annual summary document, "Marine Environmental Assessment – Chesapeake Bay," which examines weather impacts on marine environmental activity (e.g. commercial fishing, boating, pollution events, and shipping). NESDIS has also transferred tidal and current information to the Chesapeake Bay Program to assist in the development and calibration of hydrodynamic models.

ARMY CORPS OF ENGINEERS

The Corps of Engineers is involved in numerous projects affecting the water quality and living resources of the Bay. The Chesapeake Bay Shoreline Erosion Study, authorized in June 1983, is the first comprehensive study of the critical erosion problems affecting the Bay. The reconnaissance phase report, completed in March 1986, recommends development of a comprehensive plan for 135 miles of identified critically eroding shoreline. The second part of the study will examine the feasibility of a range of possible solutions and is to be completed by September 1989.

At the request of Maryland and Virginia, the Corps began the Potomac River Hydrilla Study in 1984 to evaluate the cost-effectiveness and environmental impacts of hydrilla control. The final report was approved in March 1986. The recommendation for mechanical harvesting of about 290 acres over ten years by Maryland and Virginia is being successfully implemented. In 1984, EPA's Bay Program initiated a multiyear effort to map and record the distribution of SAV. The Corps contributed $161,000 and $60,000 to this work in 1985 and 1986. Extensive data were collected through aerial photography and field surveys between 1984 and 1986. This effort will enable Bay researchers to quantify the link between improved water quality and improved habitat.

In late 1985, the Dredging Division of the Water Resources Support Center at Fort Belvoir, Virginia initiated a series of meetings with federal and state agencies from Maryland and Virginia to discuss the beneficial uses of dredged material in the Bay and to develop a list of potential sites for habitat restoration. Five potential oyster enhancement sites have been identified, and additional fisheries habitat candidate sites are under review.

UNITED STATES GEOLOGICAL SURVEY

The USGS has several programs directly related to assessing the water quality in major tributaries of Chesapeake Bay as well as evaluating the effectiveness of agricultural and urban BMPs in various geologic formations of Pennsylvania, Maryland and Virginia. In the Susquehanna, Choptank, Patuxent, Potomac, Rappahannock, Mattaponi, Pamunkey, and James rivers, the USGS is collecting suspended sediment and chemical data, including nutrient data at the fall line.

In Pennsylvania's Conestoga River, the USGS operated a surface and ground water agricultural BMP monitoring program for the fifth year. USGS is monitoring the nutrient loadings from two headwater farms in York and Adams counties. In the Lower Susquehanna basin, the Susquehanna River Basin Commission (SRBC) is assessing the differences in nutrient loadings between base loads and storm events at thirteen sites.

In the Patuxent River basin, the USGS began collecting hydrologic information at thirteen sites to evaluate BMPs during FY86. Also in Maryland, drilling and instrumentation has recently been completed in three infiltration basins to determine their effectiveness in confining urban stormwater as well as to quantify the effects of infiltration on ground water quality.

SCS Accomplishments for BMP Implementation (1984 – 1986):

	MD	PA	VA
Conservation Plans prepared (acres)	155,000	142,730	232,000
Technical help to farmers (numbers)	13,000	14,070	14,000
Soil saved (tons)	231,000	1,285,430	571,000
Animal waste systems (number)	58	245	57

A geographic information system is being used in Virginia's Elizabeth River to assist in hydrologic interpretations. The first phase of the project, which began in April 1986, is to input data on land and water uses, pollution sources, and critical habitats. USGS will assist in interpreting transport directions and the impact of contaminants as a function of surface and ground water movement.

SOIL CONSERVATION SERVICE

The Soil Conservation Service (SCS) philosophy and strategy are to integrate water quality considerations into all of its programs and activities. In FY86, SCS increased resources in the districts and the three states participating in the Bay Program with a total of $1,140,000 and 31 staff positions. In addition, it provided one fulltime SCS Liaison and Resource Conservationist headquartered at the Chesapeake Bay Liaison Office. SCS obligated $17,785,000, which included 215 staff years, in FY86 to benefit water quality throughout the Chesapeake Bay area. Major SCS activities included: providing technical assistance for agricultural and urban BMPs; supplying technical standards and specifications for the states' cost-share programs; providing training for conservation district technicians; and educating farmers to encourage participation in volunteer nonpoint source pollution control programs.

SCS achievements in water quality improvement are dependent upon close cooperation of federal, state, and local units of government, and conservation districts. Through this cooperation, SCS achieved several accomplishments in FY86. SCS assigned staff to the MD Department of Agriculture, PA Department of Agriculture, PA Bureau of Soil and Water Conservation, and VA Division of Soil and Water Conservation to assist with the implementation of state cost-share programs and demonstration watersheds, train conservation district technicians, and develop standards, specifications, and program guidelines.

SCS and USGS are working together to develop a GIS for the Bay watershed. SCS is providing soils and land use information. In addition, SCS along with other USDA agencies initiated action to implement the 1985 Farm Bill which will compliment Chesapeake Bay cleanup efforts.

ENVIRONMENTAL PROTECTION AGENCY

The EPA is the lead federal agency in the Chesapeake Bay restoration and protection effort. It staffs the Chesapeake Bay Liaison Office in Annapolis and has provided close to $24 million (1984-1986) for its Chesapeake Bay Program.

Annually, approximately $7 million is provided in grants to Bay states for projects to control agricultural and urban nonpoint source pollution problems. These grants supplement state cost-sharing and education efforts which encourage farmers and others to use BMPs.

EPA provided $1.6 million (1984-1986) to support Bay mainstem monitoring efforts in Maryland and Virginia. An additional $1 million was supplied for the Data Management Center in Annapolis which stores and processes monitoring data and carries out the mathematical modeling efforts underway, to predict point and nonpoint source pollution loadings.

The Citizens Program for the Chesapeake Bay, Inc. received grants totaling nearly $638,000 (1984-1986) for public information, citizen monitoring, support of the CAC, and citizen participation.

The Chesapeake Research Consortium (CRC), through a cooperative agreement with EPA, supports the STAC. CRC also assists the Bay Program in obtaining scientific and technical advice and analysis to support monitoring and modeling.

In addition to efforts coordinated under the Chesapeake Bay Program, the EPA is already involved in numerous federal programs which benefit the Bay. In FY85, $170 million was provided for wastewater treatment facility upgrading and construction in Bay states. In FY85, $15 million was provided for states to support baseline environmental programs and special water quality efforts supporting point and nonpoint source control programs. Under Superfund and RCRA, the Agency performs on-site investigations and cleanup programs, and issues waste disposal permits. The EPA is responsible for enforcing the National Environmental Policy Act (NEPA) and wetlands provisions of the Clean Water Act.

U.S. FISH AND WILDLIFE SERVICE

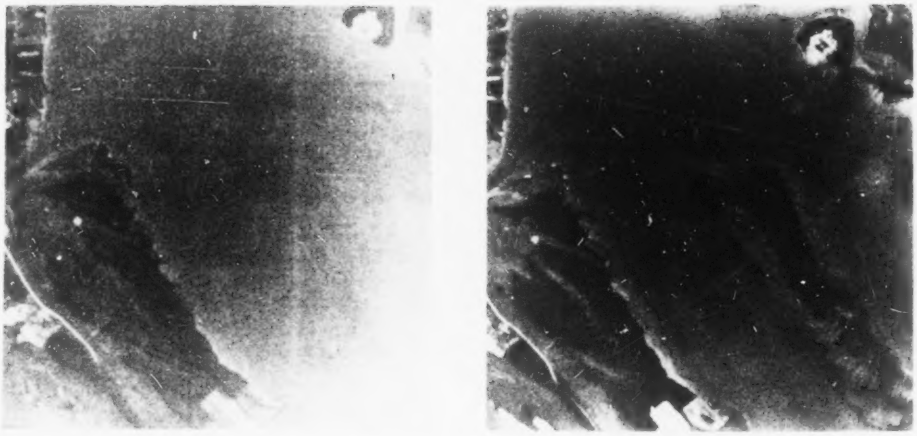
Since signing a Memorandum of Understanding (MOU) with EPA, F&WS has done extensive work in monitoring and analyzing water quality data, and relating the results to living resource health. F&WS has also played an important role in public relations. The broad aim of the F&WS nonpoint source work is to document water quality conditions and relate them to land use practices and affected biological resources.

One of the highlights of F&WS research is its Choptank watershed program. For two years, water quality was sampled at 35 stations in the Choptank Watershed in order to develop recommendations for the agricultural community on which BMPs are most beneficial to water quality. In related work, F&WS has identified six subwatersheds with nitrate concentrations higher than 5 ppm.

F&WS point source studies included sampling three National Permit Discharge Elimination System (NPDES) outfall sites for organisms and sediment in 1985. Analysis of the Chesterfield, Virginia power plant fly ash site indicated high selenium levels in the settling area. At the Indian Head Maryland U.S. Naval Explosive facility, several inorganic metal levels appeared high. In 1986, F&WS revisited all 1985 sites and added bioassay testing and histopathology analysis. Preliminary results from the first two sites indicated chronic toxicity to small invertebrates.

F&WS is involved in several activities to track and assess key Chesapeake Bay living resources, particularly SAV. In both 1985 and 1986, F&WS jointly supported comprehensive aerial photography and a Baywide map report program of SAV.

The Service also completed a list of Chesapeake



Aerial photographs show the dramatic resurgence of SAV off the coast of Barren Island on the Eastern Shore from 1984 to 1985.
Courtesy of US EPA Environmental Photographic Interpretation Center

Species of Special Emphasis (CHESSE's) and began trend analysis on 35–40 waterfowl species on this list. A special study of black duck habitat changes in three eastern shore counties was completed. A report on this project and one on the status of ospreys on the mid-Eastern Shore are due early in 1987. A report on the photo-interpretation of shoreline alterations in two western shore Maryland counties between 1950 and 1980 will be released in the spring of 1987.

The broad aim of the F&WS Striped Bass Program is to supplement and restore low breeding stocks. In the autumn of 1985, F&WS cooperated with Maryland fisheries personnel to release about 200,000 specially tagged, 4–10 inch rockfish into rivers where parent fish were taken in spring. Maryland's production goal in 1986 was 1 to 1.5 million released fish. Virginia joined the program in 1986. Both states used federal and state hatcheries for fish rearing.

F&WS had a very active public information program in 1985–86. The Service developed and set up exhibits at numerous public events. It has produced a coloring book on the mythical Chessie monster and several fact sheets on Bay fish and wildlife species. F&WS worked with the Corps of Engineers to produce a guide for SAV identification, and the Service cooperated in a television film on striped bass.

PROGRAM SUPPORT

Program support functions provide the administrative and analytic services needed to knit together the substantive elements of the Chesapeake Bay Program. These functions include public information/participation, data management and analysis, grant and contract administration, committee support, and provision of technical advice and coordination.

PUBLIC INFORMATION/PARTICIPATION

The Citizens Program for Chesapeake Bay, Inc. (CPCB) continued to produce educational and informational materials and to organize opportunities for interested citizens to become directly involved in the Chesapeake Bay Program.

Highlights of the year included distribution of the first printing of 21,000 copies of "Baybook: A Guide to Reducing Water Pollution At Home." Initial response to the publication was so enthusiastic that CPCB solicited funds from a number of agencies, organizations and corporations, and was able to produce a second printing of 36,000 copies. Baybook is being distributed through soil conservation districts, garden stores, and community and civic associations. CPCB also produced a brochure describing the kinds of services it provides to the public. The brochure was mailed to garden clubs, service organizations, schools, and community groups. Four issues of Chesapeake Citizen Report were published and distributed to over 12,000 people.

The volunteer monitoring program was expanded. The success of the initial efforts on the James and Patuxent rivers, where 30 volunteers continue to take weekly samples, led to the establishment of a program on the Choptank River under the auspices of the Maryland Department of Natural Resources. Planning and recruiting for a program on the Conestoga River in Pennsylvania began in the fall of 1986. CPCB staff also assisted the City of Annapolis in training volunteers for Back Creek. They trained

U.S. FISH AND WILDLIFE SERVICE

Courtesy of US Fish & Wildlife Service

Volunteers testing water quality of Jug Bay Wetlands Sanctuary on the Patuxent River in Maryland.

Courtesy of Citizens Program for the Chesapeake Bay, Inc.

the West River Association to start a citizen monitoring group on that river. The handbook which CPCB developed has been revised and is used by each volunteer. Data have been entered into the computer at the Chesapeake Bay Liaison Office in Annapolis, MD. Monitors are kept informed about the program through a bimonthly newsletter called "Rivertrends."

CPCB expanded its program into Pennsylvania by awarding three contracts to the Pennsylvania Association of Conservation District Directors, the League of Women Voters and the Susquehanna River Tri-State Association. These groups conducted a wide variety of educational activities, including town meetings, tours, slide shows, educational brochures, a farm survey and a series of fact sheets on the Susquehanna's connection to the Bay. In May 1986, CPCB hired a full-time staff person in Harrisburg who is working with citizens and agencies.

The citizen volunteers submerged aquatic vegetation (SAV) monitoring project initiated on a small-scale in 1985, grew to a sizable effort in 1986. Yacht clubs and marinas were enlisted to participate in mapping submerged grasses. Over 500 citizen volunteers participated.

In Virginia, the need for timely information related to the new river basin citizen advisory committees was met with the creation of a monthly newsletter called "Chesapeake River Report." The newsletter highlights statewide issues of interest and focuses each month on specific activities in each of Virginia's major river basins. It is being used as a model for similar publications in the other states.

The CPCB provides staff support to the Citizens Advisory Committee (CAC) and its five issue oriented task forces. In 1986, support included participation on the task force which developed a Bay Program Communication Strategy, secretariat support for four quarterly meetings of the CAC, and numerous task force activities. CPCB also assisted the CAC to submit testimony to Senator Charles Mathias for an oversight hearing concerning future directions for the Bay Program.

The Chesapeake Citizen Directory was updated. This involved contacting over 300 agencies and organizations. The new edition of the directory includes a number of groups not included in the first publication. CPCB staff participated in numerous citizen organization meetings, worked with Chesapeake Bay Foundation (CBF) and the Junior League of Annapolis to develop a slide show for homeowners, gave many presentations to groups, and filled hundreds of requests for information. Staff helped plan a major Bay-related conference in Baltimore County, Maryland, produced an exhibit on citizens monitoring, participated in a number of outdoor festivals, and consulted with organizations needing help to arrange Bay-oriented functions.

The goal of monitoring within discrete watersheds was pursued. A project to develop a handbook for rivershed associations was initiated and the CPCB staff assisted with the planning of and participated in several basin events. These events included a Chester River workshop and a Baltimore County River and Streams conference. Mailing lists are being coded by basin to allow easy access to citizens in particular watersheds.

DATA MANAGEMENT

Achievement of the goals of protecting and restoring Chesapeake Bay relies directly on acquiring, analyzing, and presenting data. The integrity of Chesapeake Bay Program (CBP) data directly affects the ability of governments to formulate justifiable laws, regulations, and policies. Data management includes editing, reformatting, and documenting incoming data in addition to appraising and potentially incorporating new methods of data organization such as a geographic information system (GIS).

Chesapeake Bay data are stored and managed at the CBP Computer Center in Annapolis, MD. The data base now includes a fully documented historical component dating back to 1880. It also contains the information from CBP's water quality monitoring program that began in June 1984 which includes water chemistry data for the main Bay and tidal tributaries. Climatic, shoreline location, bathymetric, and biological data have also been contributed.

Additional software applications installed in FY86 have placed increased demand on the CBP Computer Center. A watershed model and steady state, water quality model have been loaded onto the computer. A geographic information system has also been installed to provide analysis and presentation of data with varying spatial resolution.

To meet the FY86 demand on the Computer Center, EPA and the CBP partners purchased additional equipment and software. Contractor support staff doubled from FY85 to FY86 up to 12 members. EPA hired a full-time Data Management Coordinator to oversee Computer Center operations and to function as the CBP contact for data processing support.

The Data Management Subcommittee has produced documentation standards and data submission policy for water quality and biological data. These plans have become the cornerstone of CBP grants and contracts to ensure that data are produced in quality assured formats. Additional policy and plans have been developed for CBP GIS and Computer Center FY37 procurement needs.

OTHER SUPPORT

Another important management element performed through CBLO staff is the coordination of monitoring activities through support of the Monitoring Subcommittee and management of the mainstem monitoring grants to Maryland and Virginia. The Modeling and Research Subcommittee (MARS) activities on the watershed model, steady-state model, and planning for the time-variable model required extensive technical and contract management support in 1986.

Grant and contract administration, including processing awards, modifications, evaluation of deliverable products, and closeouts is essential to the management of most Bay Program work. Finally, committee support is provided by the Chesapeake Bay Liaison Office. The Executive Council and Implementation Committee and their five subcommittees are joined by numerous ad hoc task forces requiring preparation of agendas, briefing materials, reports, and minutes.

Technical support is provided to the Program through the services of the STAC, Chesapeake Research Consortium, the Model Evaluation Group and Chesapeake Bay Program staff. CBLO staff supplements the Citizens Program efforts in public information, media relations and other public affairs activities.

Outlook

Through an effective partnership of state, federal and regional agencies, and citizens concerned about the Bay, we have made progress in the past two years. Still, the Chesapeake Bay Program has only begun. We have much to do to restore and protect the living resources and water quality of the Bay.

We have much to learn about the Bay ecosystem. For example, we do not fully understand how nutrients and toxic substances are transported and modified as they move within the ecosystem. We have not clearly defined how nutrients are released from the sediments and how they can then contribute to the algae and dissolved oxygen problems. We also need to better understand the fate and transport of toxic contaminants, both organic chemicals and heavy metals, in the estuarine environment. Without a clearer knowledge of their behavior, it will remain difficult to propose and adopt criteria and standards for these contaminants.

Despite the unknowns, our programs are developing and will improve. As we learn more about the Bay ecosystem and better define goals, programs are modified to make them more effective. As we change programs, we may also modify how and through whom they are implemented. Through the Agreement partnership, we have created new institutions—committees cutting across agencies, states, and the region. What we learn through the partnership will lead us to form more effective working arrangements. As we move forward, other estuarine programs around the country are tracking our progress and using our Program as a model for structuring their own cleanup efforts.

The activities of each federal agency and political jurisdiction for the Bay will continue to be reported to the people of the region. The Bay Program will also address public concerns and welcome advice about the Bay's problems from a variety of sources. Our program, policies, and laws are important, but without the long-term support and participation of an informed citizenry we cannot succeed. Only long-term public support will enable the necessary work to continue. People of the region and the nation must understand that the Bay's problems have no instant solutions. Decades of hard, creative work and many dollars will be required.

The Executive Council pledges to continue the work to bring back the Bay. The three new governors who have taken office in Virginia, Maryland, and Pennsylvania since 1985, have reaffirmed the commitment to the restoration and protection effort.

Although ours is a long-term effort, we are proud of the incremental improvements already attained, and hope to be able to point to accelerated progress in the near future.

CHESAPEAKE EXECUTIVE COUNCIL 1986

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COORDINATING FUNCTION OF EPA

Senator SARBANES. One of the things that EPA does there is we have a coordination of the various federal agencies: The Department of Defense, NOAA, the Corps of Engineers, the Geological Survey, the Soil Conservation Service, and the Fish and Wildlife Service.

To date, the Chesapeake Bay program has been successful. More needs to be done. We have completed the first critical phase. We now move into phase 2. Mr. Chairman, in order to give impetus to the effective implementation, we would hope that it would be possible to fund this program at the authorized level of $13 million.

These funds would provide for much-needed EPA staffing and technical support to carry out research and monitoring of toxins and nutrient reduction, enhancement of EPA's computer and data management capabilities, and an acceleration of the effort to control nonpoint source pollution.

This committee has been receptive in the past in recognizing the importance of this program. You have been most helpful to us. All of us involved in this cleanup effort of one of our nation's great natural resources are grateful for your past support and look forward to its continuation in the future.

Senator PROXMIRE. Thank you very much, Senator Sarbanes. Senator Sarbanes, I am very impressed by the fact that you, as busy as you are and as a member of the Iran Committee, and a very active member, that you were able to come over here and spend some time before the subcommittee in making this particular appeal.

The President, as you know, wants to fund the program next year at $10.3 million. That is a slight increase over the current level. This appears to conform to the Senate Budget Resolution, which assumes modest increases in EPA's budget.

Your request for the full authorization of $13 million is slightly over the President's request. We will do our best. I promise we will. If I didn't, your colleague, who is a member of the committee, Barbara Mikulski, would make sure that we did better than even I would want to do. [Laughter.]

As both Senators, I am sure, are well aware, another fine Maryland Senator who was a ranking member of this subcommittee for many years was instrumental in starting the Chesapeake Bay program. I refer to Senator Mathias. He was, of course, very ably succeeded by Barbara Mikulski, who is doing a fine job on this Committee.

Senator SARBANES. Mr. Chairman, I am delighted to see Senator Mikulski on this committee.

Senator PROXMIRE. I am sure you are. [Laughter.]

EPA MONEY CRITICAL

Senator SARBANES. In more ways than one, that is for certain, and there has been a strong Maryland connection, but we think this program is a national model, and the OTA, the Office of Technology Assessment, has recognized that. We are very gratified to their underscoring its importance. In the total picture, the EPA money is not a lot of money, as we deal with these figures, but it is critical to moving this program, because it is the EPA that really holds this thing together.

These hundreds of millions that are coming out of the state government and the strong effort that is going on in the private sector very much relate to this pivotal role which EPA plays.

Senator PROXMIRE. Senator Mikulski?

Senator MIKULSKI. Senator, I just wanted to be here to receive the testimony of my colleague, who has worked so hard on the bay and also in getting me on this committee. As you know, Senator Mathias was, in many ways, the father of the bay program. Since Senator Sarbanes joined him in the Senate, the bay cleanup has had a very strong Maryland effort, and I am happy to be associated with their effort.

I think Senator Sarbanes' requests are truly based on need rather than on what OMB thinks would do the job. We look forward to working with you to fund the bay, and we would look forward to having you on the bay at any time you would choose. We could even maybe work out a deal with Virginia to slip you a rockfish. [Laughter.]

Senator PROXMIRE. If you can find a way to bring Wisconsin in, you have got it made. We have a lot of push behind this program, dollar-for-dollar, probably more than anything else that is before the subcommittee.

Thank you very much, Senator Sarbanes.

Senator SARBANES. Thank you.

[The statement follows:]

STATEMENT OF SENATOR PAUL S. SARBANES

Thank you Mr. Chairman for this opportunity to testify on the funding request for the Environmental Protection Agency's Chesapeake Bay Program. I recently wrote, together with the five other Bay-area Senators from Maryland, Virginia and Pennsylvania, to request the Committee's approval of a $13 million appropriation for fiscal 1988 for this program and want to underscore the need for this funding and the critical importance of the EPA to the Chesapeake Bay cleanup effort. I ask that a copy of our letter be included in the record of today's hearing.

At the outset, I would like to thank the Committee for your assistance on behalf of the Chesapeake over the years. The Committee appropriated the first funds in 1975 for the now-famous EPA Chesapeake Bay study which provided the impetus for the joint State/Federal clean-up program and served as the basis for continued Federal funding. I know I speak for all who have joined in the "Save the Bay" effort in expressing my deep appreciation for your help.

As you know, earlier this year the Congress, in voting to override the President's veto of H.R. 1, the Water Quality Act of 1987, enacted a very important piece of legislation, reauthorizing and improving the Clean Water Act. In addition to other programs to improve the Nation's water quality, this bill recognizes the national importance of the Chesapeake Bay and authorizes $13 million a year over a four-year period to continue the State-Federal Chesapeake Bay Program. The bill provides $3 million a year to support the Office of Chesapeake Bay Programs in the Environmental Protection Agency, an office located in Annapolis, Maryland, and in addition provides $10 million a year in cost-shared grants to the Bay-area States.

The Chesapeake Bay Program, authorized for the first time under the Water Quality Act, is the culmination of the seven-year, $27 million EPA Chesapeake Bay study, to which I referred above. This study, inspired by our former colleague Senator Mathias, was released in 1983 and documented the decline of the water quality and living resources of the Chesapeake. It identified three critical factors causing this decline: the high level of toxic chemicals entering the Bay, excess levels of nutrients from point and non-point sources, and the serious loss of submerged aquatic vegetation and recommended a course of action to clean up the Bay.

We have made great progress in laying the groundwork for the restoration, protection and enhancement of this great national resource since that study was completed. With the signing of the historic Chesapeake Bay Agreement in December, 1983, the EPA and the States of Maryland, Pennsylvania and Virginia as well as the District of Columbia have initiated an aggressive new program and are working together toward common solutions to the Bay's problems. EPA and other major federal agencies, in an effort to coordinate Bay-related activities within the Federal government, have signed Memoranda of Understanding outlining their own responsibilities for the Bay program. EPA and the States have developed and published the Chesapeake Bay Restoration and Protection Plan which establishes broad goals and objectives of the Bay restoration efforts and details the initiatives being undertaken by each of the participating jurisdictions in pursuit of those goals.

This joint Federal/State program has been heralded recently in a Congressional Office of Technology Assessment (OTA) study as a model for other estuaries around the country and as an outstanding example of intergovernmental cooperation and environmental management. EPA is the lead federal agency in this effort. In addition to its other important responsibilities under the Water Quality Act, EPA coordinates the Bay-wide monitoring network, manages the computer data base, supports citizen participation and education, participates in the development of water quality models of the Bay, and oversees the disbursement of cost-shared grants to the States. EPA serves, in effect, as the glue which binds the Bay program together and its continued involvement is critical to the success of the program.

Mr. Chairman, the funds received by EPA are used for the Chesapeake Bay Liaison Office and for cost-sharing grants to the states to implement the recommendations of the 1983 Bay study and the Restoration Plan. The three Bay states and the District of Columbia must match these funds and have used them very effectively to develop nonpoint source programs to control agricultural and urban pollution. The results have been impressive -- approximately 90,000 acres have been treated with best management practices, saving 500,000 tons of soil from eroding and stopping 600,000 pounds of phosphorus entering the Bay.

In addition, the States have adopted far-reaching initiatives of their own and have expended over $200 million in new State dollars for the clean-up effort since the signing of the Chesapeake Bay Agreement. The State of Maryland has allocated over $130 million to support 35 Bay initiatives, including implementation of Best Management Practices, striped bass stocking and tagging, sediment control programs, and shoreline stabilization projects. Virginia has allocated over $50 million for 30 initiatives similar to Maryland's and Pennsylvania has committed approximately $10 million for development and implementation of a comprehensive agricultural nonpoint source pollution control program. The District of Columbia has focussed its efforts and funding at improving the Blue Plains Sewage Treatment Plant and improving the water quality in the Potomac and Anacostia Rivers.

The Chesapeake Executive Council which oversees the implementation of State and Federal plans to clean up the Bay, recently completed the Second Annual Progress Report under the Chesapeake Bay Agreement. This report spells out in greater detail the progress of State and Federal programs to bring back the Bay as well as efforts planned for the future. I would like to submit a copy of this report for the record.

To date, the Chesapeake Bay program has been very successful, but much more needs to be done to restore the Bay. We have just completed the first critical phase of the clean-up effort. The phase II agenda will refine current efforts, establish specific goals and control efforts, and improve upon Bay-wide monitoring programs and computer models so that they can be used to assess the effectiveness of future control actions.

Mr. Chairman, it is important to give impetus to the effective implementation of phase II of the Bay clean-up program by providing funding in the fiscal 1988 appropriations bill at the authorized level of $13 million. These funds would provide for much-needed EPA staffing and technical support to carry out research and monitoring of toxics and nutrient reduction, enhancement of EPA's computer and data management capabilities, as well as accelerate the non-point source control efforts of the Bay States through the use of matching grants.

The Subcommittee has recognized the importance of this program in the past and has been most helpful. All of us involved in this clean-up effort of one of our nation's great natural resources are grateful and look forward to your continuing support.

INTRODUCTION OF WITNESSES

Senator PROXMIRE. Our next witnesses are Michael Allen, representing the Lac du Flambeau Chippewa Tribe; James Hieatt, chairman of the AIAA Space Systems Technical Committee, American Institute of Aeronautics and Astronautics; Dr. Steve Flajser, Institute of Electrical and Electronics Engineers; Samuel Harvey, who is representing Georgetown University, and T. Byron Collins, if Mr. Collins is here with him, and Philip Speser.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

STATEMENT OF BETTY GRAVEEN, LAC DU FLAMBEAU CHIPPEWA TRIBE

Ms. GRAVEEN. I am replacing Michael Allen.

Senator PROXMIRE. Our first witness is—you say you are representing Michael Allen?

Ms. GRAVEEN. My name is Betty Graveen.

Senator PROXMIRE. Ma'am, go right ahead.

Ms. GRAVEEN. We have prepared written testimony, so I am not going to take the time.

Senator PROXMIRE. The entire statement will be printed in full in the record. You will have 4 minutes to summarize.

HOUSING AND COMMUNITY DEVELOPMENT ACT OF 1987

Ms. GRAVEEN. However, we would like to speak in favor of that H.R. 4 bill, that Housing and Community Development Act of 1987. H.R. 4 would authorize 2,000 Indian housing units for fiscal year 1988. It would take steps toward alleviating the great hardships caused to our clients by the increase of rentals to 30 percent of gross income.

Housing authority is facing a crisis in rental program payments also under the current formula. Our tenants are undergoing hardships, as well. Our tribal governing body feels that 30 percent of the gross income is very unfair considering the rehab problems that we are having does not leave them enough money for the housing authority to rehabilitate the present, especially the turnkey III project.

Our tenants have to pay 30 percent of their gross income, pay their own utilities, expenses, and considering northern Wisconsin's icy winters, except for this past winter, it is really creating havoc, and our accounts receivable are rising because of that. We would respectfully request the committee to look at that change in our housing.

I appreciate the opportunity to come here and speak before you, sir. Thank you.

Senator PROXMIRE. Thank you very much for a very good presentation. We appreciate that. We will certainly give it very thorough consideration, particularly in view of the fact that you come from Wisconsin.

Ms. GRAVEEN. Thank you.

[The statement follows:]

STATEMENT OF MICHAEL W. ALLEN, SR., CHAIRMAN, LAC DU FLAMBEAU BAND OF LAKE SUPERIOR CHIPPEWA INDIANS

Mr. Chairman and members of the subcommittee, my name is Michael W. Allen, Sr., and I am the Chairman of the Lac du Flambeau Band of Lake Superior Chippewa Indians, a Chippewa tribe located in northeastern Wisconsin.

Our Tribe is a small one, or around 2,200 members. About 60% of these, or about 1,300 members, live on or near our reservation. Despite recent economic development activities of the Tribe which have brightened our future, many of our members continue to live in poverty. 65% of our workforce is unemployed.

The Tribe established a housing authority in the 1970's and constructed housing units funded by various HUD programs. Before the housing authority began its operations, tribal members lived in housing that was by and large clearly substandard, much of it in a deplorable condition. There was virtually no public sector development of housing for tribal members -- and this on a reservation of 126 lakes with many fine summer homes for the wealthy from southern Wisconsin and Illinois.

Thanks in large measure to HUD programs and our housing authority's efforts, the Tribe now maintains 333 public housing units -- homeownership, rental and elderly -- for its members. A number of non-Indian spouses and children are housed there as well. Today the majority of tribal members live in public housing, and thanks to this housing most members live in safe, sanitary and decent housing.

There is much more to be done, however, and that is what has brought me before you today. Our housing authority today has a waiting list of 150 households. A family must live on the reservation for a year in order to be eligible to be placed on the list, and once on the list a household must wait a year or more to obtain a home. Almost all of the families on the list are living in substandard housing, or are crowded into existing housing authority units, living with another household and rendering that public housing unit overcrowded.

No private sector alternative for these families has presented itself. The Tribe must, look to HUD programs to meet this housing need on our reservation.

Because our unmet need, we were appalled and dismayed when the Reagan Administration announced its HUD budget for FY '88 of $10.2 billion, a 20% cut from HUD's FY '87 level. This proposal budget involves only 1000 units for Indian families — a tragically small number when the BIA has figured that 92,580 Indian families are in need of assistance nationwide. Current needs would not be met for three generations at this level.

The administration proposal represents a cut for Indian housing of almost 60% from FY '87. This cut would be compounded by a proposal for rescission of budget authority recaptured in FY '88.

We strongly oppose the administration's proposal cuts and urge the subcommittee to reject then and provide adequate funding to maintain current progress in developing adequate housing on the nation's Indian reservations.

I would also like to speak in favor of H.R.4, the Housing and Community, Development Act of 1987, and of other legislative initiatives which would separate Indian housing from other public housing program within HUD.

We feel that a legislative separation of Indian programs is needed in order to more adequately address the unique problems posed by housing on Indian reservations.

H.R.4 would authorize 2000 Indian housing units for FY '88 and would take steps toward alleviating the great hardships caused our tenants by the increase of rentals to 30% of gross income. Our housing authority is facing a crisis in rental payments under the current formula, and our tenants are undergoing hardship as well.

Thank you for allowing me the opportunity to share our concerns with you. Over the last two decades the Tribe has availed itself of HUD housing programs to bring about a true revolution in housing on the reservation, with the accompanying gain in health, well-being, and self-esteem. More needs to be done, however, to equalize the opportunity among those in need.

The Administration has cut HUD the most of all the agencies, and it has indicated that it is perfectly willing to leave the task of providing housing unfinished. The Subcommittee should reject this approach and continue its progress in completing this task.

ADDITIONAL PREPARED STATEMENTS

Senator PROXMIRE. Committee staff has received a number of statements of witnesses who were unable to testify orally. Without objection, their prepared statements will be inserted into the hearing record at this point.

[The statements follow:]

STATEMENT OF THE NATIONAL ASSOCIATION OF REALTORS

Mr. Chairman, my name is Nestor R. Weigand, Jr. I am a REALTOR® from Wichita, Kansas, and will serve as President of the NATIONAL ASSOCIATION OF REALTORS® in 1988. On behalf of the more than 775,000 members of our ASSOCIATION, I want to thank you and the members of your Subcommittee for the opportunity to present our views on housing issues and future housing legislation.

Over the past six years, the NATIONAL ASSOCIATION OF REALTORS® has reviewed, analyzed and commented upon a multitude of changes this Administration has proposed regarding the various federal housing credit programs. We are here today to, once again, express our concerns about the relentless, piecemeal approach of the Administration to dismantle these programs. It appears evident that the Administration will continue its efforts to privatize these federal programs in order to further its objective of reducing the federal government's role in housing. In keeping with the efforts of the National Association of Home Builders, the Mortgage Bankers Association and this ASSOCIATION, we believe that it is imperative that Congress develop a formal **NATIONAL HOUSING POLICY** in order to provide a reasoned framework in which to address this nation's housing needs. Our members are of the strong opinion that there continues to be a very necessary role for the federal government to play in housing, and are convinced that the American public would agree.

THE ADMINISTRATION'S FY1988 BUDGET PROPOSALS

"User Fees"

As part of the deficit reduction campaign, the President's FY1986 and FY1987 budget proposals included "user fee" provisions affecting the Federal Housing Administration (FHA), the Veterans Administration Home Loan Guaranty Program (VA), the Government National Mortgage Association (GNMA), the Federal National Mortgage Association (FNMA), the Federal Home Loan Mortgage Corporation (FHLMC), and the Federal Home Loan Bank System (FHLB). In most instances, these "user fees" were not needed to aid the financial stability of the respective insurance funds or the programs themselves. Furthermore, the proposed fees were estimated to have a minimal effect, at best, on the national deficit. However, if these "user fee" provisions had been imposed, they would have had a dramatic negative impact on the participation and use of the programs by the homebuying public. Depending upon the type of program, these fees would have either increased the cost to the homebuyer and/or discouraged participation. These fees represented nothing more than a "tax" on homeowners, and we strongly opposed them.

o FHA: Although the Administration's most recent FY1988 budget proposals recommend "user fee" increases for only FHA and VA, the effect remains the same. In the case of FHA, the Administration has recommended an increase in the existing fee, the FHA mortgage insurance premium (MIP), from the current 3.8 percent to "a level on par with those that private insurers would charge to provide a comparable guarantee." While the Department of Housing and Urban Development (HUD) has estimated that this level would be 5 percent, representatives of the private mortgage insurance industry have indicated that determining the premium level is very difficult, and have named no specific percentage increase.

The Administration's previous and current rationale for this increase is that the default experience of FHA loans originated in the 1981-1982 period would require the FHA to provide additional protection to the FHA insurance fund in the event of "unanticipated future losses." Mr. Chairman, the NATIONAL ASSOCIATION OF REALTORS® has conducted an analysis of the FHA Mutual Mortgage Insurance Fund (MMIF). After a review of the most recent acturarial experience, it is clear that there is absolutely no need to raise the FHA MIP. In fact, there is substantial evidence to support a reduction in the existing 3.8 percent level.

Furthermore, according to our study, the principal justification for the Administration's proposal to raise the MIP (to provide additional protection against future losses from 1981-1982 defaults) is flawed. The 1981-1982 default experience is an aberration from the long-term experience of the FHA 203(b) program. In addition, the high mortgage interest rates and large monthly mortgage payments which contributed to the high default rates for 1981 and 1982 have resulted in extremely high non-claim terminations (prepayments and refinancings). Finally, the point of the maximum rate for bad loans originated in 1981 and 1982 is over because default rates on FHA mortgages traditionally peak in the third year after origination. As a result, the total number of mortgages that would be available to default from 1981 and 1982 is very low.

In summary, Mr. Chairman, the proposed increase in the MIP is completely unjustified based on the current soundness of the MMIF. Since 1940, FHA has been self-supporting, and there is no evidence to support the contention that the Fund's current reserves ($4.3 billion as of December 31, 1986) are inadequate to cover any "future anticipated losses." Indeed, the high level of over-insurance that the MMIF enjoys could easily justify a decrease in the MIP.

The NATIONAL ASSOCIATION OF REALTORS® also questions the Administration's proposed fee increase as a means to reduce the federal deficit. It appears more likely that these fee increases would reduce the use of FHA and VA and, therefore, result in a reduction in revenue to the respective insurance funds. In fact, the Administration acknowledges this phenomenon in its FY1988 request for FHA credit authority which presupposes a reduction in FHA loan activity due to the fee increase and other FHA program restrictions. (See page 8 -- for details on program restrictions) In other words, the increased fee would likely net a loss to the government instead of a gain.

o GNMA: In December, the Government National Mortgage Association (GNMA) announced that it was implementing, effective March 1, 1987, a change in the allocation of the existing 50 basis point fee collected by issuers of GNMA mortgage-backed securities (MBSs). Currently, the fee is split between loan servicers who retain 44 basis points and GNMA which receives the remaining 6 basis points. GNMA'S share is forwarded to the GNMA Mortgage-Backed Investment Portfolio, the reserve fund which backs the GNMA guarantee. Under GNMA'S proposed change, the 6 basis points which reverts to GNMA will be increased to 10 basis points, thus reducing loan servicers' fees to 40 basis points.

According to GNMA officials, this fee increase is necessary in order to bolster existing reserves and insure that GNMA could withstand any future recessions without borrowing from the Treasury. While we realize that this reallocation in the 50 basis point fee is the first in GNMA'S history, the

NATIONAL ASSOCIATION OF REALTORS® does not believe that such a change is necessary at this time, and that it will ultimately have a detrimental affect on future FHA/VA homebuyers.

According to our data, the GNMA reserve fund is in sound condition, with a balance of $1.35 billion as of September 30, 1986. At the end of fiscal year 1986 the total loss to the fund over its entire 17 year history was $10.6 million. Never has this fund been required to meet a total agency loss. All the losses to the GNMA program have been funded from current earnings.

At the close of fiscal year 1986, $333,619 billion worth of GNMA securities had been originated. The GNMA reserve fund is currently invested in U.S. Treasury securities. According to GNMA, investment earnings to the reserve fund in fiscal year 1986 were about equal to the annual guarantee fee income. Thus, the combined guarantee fee and investment earnings to the GNMA reserve fund per fiscal year amounts to approximately $275 to $300 million. Like the FHA 203(b) single family program reserve fund, the MMIF, the GNMA reserve fund is over-collateralized. According to GNMA, the proposed fee increase will generate an additional $10 million to the reserve fund in fiscal year 1987, with the greatest increases to the fund to occur in later years.

The change in the current fee structure will result in a reduction of the basis points which are currently retained by the loan servicer. This 4 basis point loss amounts to a 9 percent decrease in servicing income. This increased cost to the mortgage originator is certain to be passed on to potential homebuyers in the form of higher points for VA loans, and a combination of increased points and higher rates for FHA loans.

Furthermore, not all loan servicers will be willing to absorb the reduction in servicing income. Therefore, many originators will be more likely to sell these loans to wholesale mortgage banking companies as "servicer-released." As a result, not only will the number of GNMA issuers be reduced, but the amount of servicers who will pass on the fee will increase.

FHA Operating and Credit Authority

o FHA Operating Authority: Mr. Chairman, last year we watched with disappointment and frustration, as FHA's operating authority expired six times. Each time there were incredible market delays as Congress debated this issue. In addition, due to unprecedented mortgage volume, FHA's insuring authority was depleted during the year.

The response from the public and the industry was dramatic. Thousands of prospective homeowners experienced delayed loan settlements, "backlogged" processing of their mortgages, and payment of higher interest rates because their lower rate commitments had expired. The disruptive effects of this situation were significant and could have been avoided.

For these reasons, the NATIONAL ASSOCIATION OF REALTORS® strongly supports legislation providing a permanent operating authority for FHA. At the very least, however, Congress should adopt a "clean" extension of FHA authority for one full fiscal year.

o FHA Credit (Insuring) Authority: Last year Congress authorized a credit (insuring) level of $100 billion for FHA. The Administration has recommended a level of $70 billion for FY1988, predicated upon the belief that HUD recommended FHA program restrictions will be adopted, thus reducing the number of insurance commitments required under FHA. (See page 8 -- for details on program restrictions)

Mr. Chairman, the NATIONAL ASSOCIATION OF REALTORS® is not as confident as the Administration that Congress will permit the implementation of these program limitations. Therefore, we do not share the opinion that $70 billion will be an adequate credit authority for FY1988. Furthermore, we strongly believe that it is important to provide sufficient credit levels so as to avoid chaotic and market-disruptive operational stoppages, such as those experienced in FY1986. We strongly urge this Committee to provide a credit authority level of at least $100 billion for FY1988.

o GNMA Guarantee Authority: The Administration's budget calls for a reduced guarantee level for GNMA of $100 billion, down from the FY1986 level of $150 billion. In order to ensure uninterrupted operation of GNMA'S MBS guarantee program, the NATIONAL ASSOCIATION OF REALTORS® recommends that Congress approve legislation providing for a GNMA guarantee level of at least $150 billion.

ADMINISTRATION/HUD'S LEGISLATIVE PROPOSALS

Separate, but not apart from the Administration's efforts, the Department of Housing and Urban Development (HUD) has made numerous legislative and regulatory proposals through its budget process which would alter fundamental aspects of the FHA program, and thereby, further restrict and reduce the participation class of FHA borrowers. In fact, Mr. Chairman, when these program limitations are combined with the Administration's "user fee" recommendations, participation by both the bottom and upper tier segments of FHA's clientele will, for all intents and purposes, be barred from using the FHA 203(b) program. I will discuss each of these proposals separately:

Excluding FHA Closing Costs from the Total Acquisition Cost

Mr. Chairman, the Administration has recommended that FHA borrowers be required to pay closing costs, in cash, at the time of origination. Currently, FHA borrowers can finance closing costs over the life of the loan.

Although this proposal does not alter the existing treatment of the mortgage insurance premium which can also be financed over the life of the loan, excluding closing costs from the total acquisition cost will make it more difficult for potential homeowners to secure a loan by increasing the amount of cash required at origination.

Using 1985 FHA statistics (the most recent available), the ASSOCIATION estimates that the average downpayment required for an FHA loan would increase by approximately $1,250 if this proposal were adopted.

Our data further indicates that FHA borrowers already have very minimal cash reserves after settlement. On average, the ASSOCIATION'S survey showed that the typical FHA homebuyer had $1,150 in reserve after closing. However, our survey also reported that over two-thirds of FHA borrowers had cash reserves lower than this figure. Clearly, increasing the amount of cash required by FHA borrowers who are already starved for cash will effectively prevent those otherwise qualified applicants from using the program.

Deregulation of the One Percent Lender Origination Fee and Post Endorsement Fees

The Administration has also suggested lifting the current one percent limit on the lender origination fee for FHA loans.

Like the proposal to prohibit closing costs from being financed, this recommendation will also increase the costs of obtaining an FHA mortgage. Those borrowers who are already burdened by these added costs, those who have minimal resources--usually first-time homebuyers--will be eliminated from participating in the FHA program. It is ironic, Mr. Chairman, that the very segment of potential homeowners that this and other proposals will eliminate is the very same class that FHA was originally chartered to serve.

Similar in its scope, is the Administration's proposal to deregulate FHA post-endorsement fees, which would also place another financial burden on FHA borrowers. An example of how this change would be used is HUD's recent assumability modification which requires a credit check on all assumptors within 24 months of origination or previous assumption. HUD has authorized a credit check fee of up to $500, which under this proposal, could be increased, thus imposing an even greater burden on FHA users.

Underwriting Criteria

The Administration has also proposed that conventional housing expense criteria be used in underwriting FHA loans. FHA's current housing expense-to-income ratio is 38 percent with a long-term debt-to-income ratio of 53 percent. If this criteria were changed to conform to conventional standards, a 25/33 proportion would be required.

Once again, Mr. Chairman, as with many of the Administration's other proposals, this particular recommendation alters a very fundamental component of the FHA program, which was established to promote availability of mortgage financing to homebuyers underserved by the conventional market.

The ASSOCIATION strongly opposes this suggestion. Perhaps more than any other proposal advanced by the Administration, this specific change would deny a substantial number of potential FHA users the opportunity to own a home. Given the small percentage of FHA users who could qualify under conventional criteria, implementation of this proposal will do little to further the Administration's goal of making FHA more competitive with the private sector.

Increased Downpayment for Families Earning Over $40,000

In offering its various FHA recommendations, one of the Administration's recurrent themes is that FHA is competing unfairly with the private mortgage insurance industry, and that efforts should be made to minimize and/or eliminate this competition.

One such recommendation offered is the proposal to require a minimum 5 percent downpayment for families earning over $40,000 per year. On its face, Mr. Chairman, it might appear that this is a "reasonable" proposal intended to target FHA's benefits.

However, on closer examination, one finds that this is not actually the case for a number of reasons. First, it is important to remember that only about 14 percent of all homebuyers in 1986 used FHA insurance. Of that 14 percent, only about 25 percent have incomes greater than $40,000. While those higher income families who use FHA insurance may be able to qualify for private mortgage insurance, the majority of these homeowners have significantly different characteristics than those borrowers using private mortgage insurance.

According to ASSOCIATION data collected through our mortgage finance survey in the spring of 1986, FHA homebuyers possess differing income, age and ownership characteristics than those in the conventional market. On average, FHA homebuyers are over 2 years younger and have annual incomes of about $10,000 less than homebuyers using private mortgage insurance. Furthermore, we found that FHA borrowers are generally first-time homebuyers. Finally, our survey showed that loan-to-value ratios for conventional market users averaged about 80 percent, compared to 92 percent for FHA users.

If a potential homebuying family with an annual income greater than $40,000 was not able to afford an FHA-required 5 percent downpayment, they would be forced to seek private mortgage insurance in the conventional market. However, if the family was unable to afford a FHA loan, it is unlikely that they could qualify in the conventional market. Most probably, these families would be denied the opportunity to purchase and own a home.

The NATIONAL ASSOCIATION OF REALTORS® is also concerned about eliminating participation of higher-income borrowers in the FHA 203(b) program because these loans act to reduce the average default characteristics of all FHA borrowers through lower loan-to-value ratios. According to HUD'S statistics, FHA borrowers with lower LTVs, all other things equal, have much lower default rates.

We also view the Administration's proposed increased downpayment proposal as a discriminatory one, because it fails to recognize the effects of a minimum downpayment on high cost regions. Furthermore, the proposal discriminates against dual income earning households, a segment of the market which has the highest homeownership rates.

Finally, the ASSOCIATION is concerned about the effects this proposal will have on the secondary mortgage market, specifically the adverse impact on future default risk on FHA mortgage pools which back GNMA MBSs. Changes in this risk, we believe, would gradually increase the required yields on GNMA MBSs, negatively affect their future price, and ultimately increase the interest rate and/or points charged on FHA loans.

Elimination of Investor and Second Homes

The ASSOCIATION is opposed to any limitation of eligibility in the FHA single-family insurance program to only purchasers of primary (owner-occupied) residences.

In 1986, HUD Secretary Pierce appointed an internal task force to investigate allegations of fraud and abuse in the FHA program. This HUD Task Force revealed that the highest incidents of foreclosures, in proportion to the FHA participant class, were in the investor portion of the FHA program.

Our ASSOCIATION, along with allied housing trade associations, worked closely with HUD to review, comment, and eventually support many of the recommendations made by the HUD Task Force. In fact, a number of these recommendations have already been implemented through agency administrative directives. However, the Task Force never recommended the elimination of the investor and second home portions of the FHA program. HUD and the Administration contend that investor and second home FHA loans are inherently risky and therefore, should be excluded from the FHA program. We maintain that this is not a valid argument because such an exclusion would have only a minor impact on the risk to FHA's MMIF. Furthermore, we believe that this proposal is, ultimately, far too drastic a solution to a problem that is already being addressed through tighter administrative standards (as discussed later in this section).

Excluding investor loans from the FHA program is also ill-advised because the percentage of investor loans constitutes a very small amount of the loans insured under the MMIF. In 1983, for example (the most recent period for which data is available), just 8.1% of FHA endorsements were classified as investor loans.

Elimination of investor loans from the FHA program would also seriously affect the single-family home rental market. It has been estimated that over one third of the 32 million renters in this country currently reside in one-to-four family residences. Eliminating investors from the FHA program would hurt a substantial portion of the rental market and affect those renters who choose not to live in multifamily dwellings.

It can also be demonstrated that claim rates have peaked for all loans endorsed during 1981 and 1982. Since the claim rates have already peaked due to a period of high interest rates, it is reasonable to conclude that the claim rates for investor/second homes have also peaked.

As for the fraud and abuse reported in this portion of the FHA program, in February 1986, HUD reported that three regions in the country had a substantially higher incidence of investor loan problems. The HUD study concluded that certain FHA field offices had unusally higher claim rates, indicating problems that may have involved fraudulent activities on the part of some investor mortgages.

The occurrence of fraud and abuse in the FHA program was a considerable contributing factor in the high claim rates experienced for FHA loans endorsed during 1961 and 1982. However, we believe that the appropriate means to address this problem is not to eliminate the investor from the FHA program. Rather, the problem of fraud and abuse should be addressed more directly. The ASSOCIATION commends HUD for taking this approach and points to the 1983-1985 claim rates as reflective of the following actions taken by HUD:

- Underwriting criteria have been tightened;
- Appraisal requirements have become stricter;
- The Mortgage Insurance Premium (MIP) has been restructured, resulting in its current form;. and
- The Direct Endorsement program, which has lower claim rates than the traditional field of underwritten loans, has been implemented.

We have endorsed these changes and have also advised HUD on their implementation. Further efforts in this regard will go further to eliminate fraud and abuse in FHA loans rather than eliminating investors from the FHA program.

CHANGE IN FHA ASSUMPTION POLICY

Easy assumability has been a feature of the FHA-insured mortgage since the inception of the FHA program. It is widely acknowledged that this feature has been instrumental in increasing the marketability of homes with a FHA-insured mortgage. In today's market where most fixed rate conventional mortgages contain "due-on-sale" clauses, the FHA and VA programs are one of the last bastions of fixed payment mortgage instruments which allow assumability.

Especially during periods of rising interest rates, the free assumability of FHA-insured mortgages has often substantially enhanced the value of a home. The buyer benefits because he or she can assume a loan below the prevailing market rate. This assumability also translates into a benefit for the seller by increasing the demand and thus, value for his/her home.

However, based on a HUD administrative announcement (HUD Mortgagee Letter 86-15), this FHA assumption policy was changed on December 1, 1986. The new policy requires a full credit check of any and all borrowers seeking to assume a FHA mortgage within 24 months of origination or of a previous assumption. HUD will permit lenders to charge up to $500 for this new credit check. Subject to HUD'S discretion, the loan can be called by the lender if the transacting parties neglect to obtain this credit check. By restricting the free assumability of the FHA loan, this change institutes a "quasi due-on-sale clause."

The NATIONAL ASSOCIATION OF REALTORS® submits that this new restriction on the assumability of FHA-insured mortgages will be detrimental to both sellers and potential buyers of such homes. For example, a prospective seller of a home subject to a FHA-insured mortgage cannot, without risking immediate acceleration of that mortgage, sell his or her home to a prospective purchaser who is willing to assume the existing mortgage but is not interested in undergoing an expensive, burdensome, and time-consuming credit check.

This change in the assumability of an FHA-insured mortgage could also have a long-term, negative impact on the FHA-MMIF. According to HUD officials, this new credit check requirement was devised in order to preclude "non-creditworthy" individuals from assuming a FHA mortgage and later defaulting on the payments. However, by requiring this credit check, it is now likely that potential homebuyers who, at one time, were willing to take over the monthly mortgage payments from a seller who was experiencing serious financial difficulty, will no longer be amenable to assuming the FHA mortgage because of the additional cost and time imposed by the new requirement. Therefore, financially-strapped homeowners with a FHA-insured mortgage will have few other alternatives but to default on their FHA mortgage. When this occurs, FHA must pay the claim and take title of the foreclosed property. FHA is then monetarily responsible for both the management and disposition of the property.

Based on the average claim rates from 1970 to 1985, it is estimated that in 1986 approximately 860 homeowners would have defaulted due to the delays caused by this new credit check process.

According to HUD data, the weighted average mortgage amount was $52,826 for loans originated in 1984 and 1985. The average loss claim for an FHA mortgage, was approximately 35 percent of the outstanding principal for that same period, or $18,595 per claim. This average claim loss, multiplied times the number of homeowners who would default due to the delays caused by the credit check process (i.e., 860 homeowners), would cause a loss to the MMIF of over $15.9 million. Losses to the MMIF, such as these, clearly could not be maintained on an annual basis without some damage to the FHA Section 203(b) program.

Of a more procedural nature, this fundamental change in the FHA program was made through an administrative announcement known as a Mortgagee Letter. The NATIONAL ASSOCIATION OF REALTORS® strongly believes that a change of this type and magnitude should have been made through the federal agency rulemaking process. For this reason, the ASSOCIATION filed a legal suit last October against HUD/FHA claiming that the procedure used to implement this change was in violation of the Administrative Procedures Act (APA). The law suit is presently pending before the Federal District Court for the District of Columbia, and a decision is expected sometime in March.

INCREASE IN THE FHA ARMs VOLUME CAP

This provision of the FHA program has been monitored very closely by the NATIONAL ASSOCIATION OF REALTORS®. The "cap" amount, based upon a percentage of the total volume of home mortgages insured by FHA during the previous fiscal year, has been and is currently 10% of that volume.

The ASSOCIATION supports an increase in the FHA ARM's volume cap of "up to 20%", as long as there is a corresponding increase in the FHA credit (insuring) authority. We have also proposed legislative report language (included in the House report of H.R. 1 in 1986) which specifies that the number of FHA ARM units, at whatever percentage, is NOT a set-aside of FHA credit authority which acts to reduce units for the fixed rate program.

The NATIONAL ASSOCIATION OF REALTORS® has long advocated a re-evaluation of the existing loan limits for FHA. As you know, Mr. Chairman, the maximum FHA loan limit for single-family loans is $67,500, except in HUD-designated high cost areas, where the base limit can be increased up to $90,000. Hawaii and Alaska are special high cost areas, and loan limits in those regions can be increased beyond the $90,000 limit.

Despite the considerable home appreciation over the past several years, neither the base limit nor the high cost calculation has been updated since 1979.

According to the ASSOCIATION'S Existing Home Sales Reports, existing home prices have appreciated by 44.2 percent since 1979. Clearly, the FHA loan limit needs to be readjusted to reflect home appreciation. Until this is accomplished, potential homebuyers will continue to face discrimination due to antiquated market standards.

If the limits were raised to reflect the 44.2 percent appreciation, we estimate that new FHA loan limits would range from $97,300 to $129,600.

EXTENSION OF THE SECONDARY MORTGAGE MARKET ENHANCEMENT ACT

The NATIONAL ASSOCIATION OF REALTORS® supports the extension of Title II of the Secondary Mortgage Market Enhancement Act, which is due to expire September 30, 1987. We are especially interested in seeing that the authority granted to the Federal National Mortgage Association (FNMA) and the Federal Home Loan Mortgage Corporation (FHLMC) to purchase second mortgage loans is extended.

Second mortgages are an increasingly important source of financing for homeownership. The availability of affordable second mortgage funds makes it possible for others to sell their current homes so that they can buy new ones.

The ASSOCIATION supports extension of this authority for FNMA and FHLMC, and continues to oppose any efforts to weaken the continuing ability of GNMA, FNMA AND FHLMC to provide funds for home mortgages and to respond to market changes.

FAIR HOUSING INITIATIVE PROGRAM (FHIP)

The NATIONAL ASSOCIATION OF REALTORS® fully supports our nation's fair housing laws. We also recognize the use of the enforcement tool of testing but only if the use of such tools is based upon reasonable and objective standards. Herein lies the basis of our ongoing concern with the Fair Housing Initiatives Program (FHIP) since it was first introduced as part of HUD'S FY1986 budget request.

With this new program the ASSOCIATION became concerned that, for the first time, direct federal funds would be used to support testing of real estate practitioners by private self-appointed fair housing organizations without any procedural safeguards or guidelines.

During 1985 and into 1986, the NATIONAL ASSOCIATION OF REALTORS® opposed the authorization of FHIP because of the absence of any standards by which the testing component of FHIP would be implemented.

In early 1986, at the behest of Senate and House Banking Committee leaders, the ASSOCIATION began discussions with HUD in order to seek an agreement on FHIP. After 6 weeks of solid discussions, HUD and ASSOCIATION President Clark E. Wallace signed an agreement which placed our support behind the FHIP program. At the same time, HUD and the ASSOCIATION worked out a fair and balanced set of testing guidelines, which were approved after considerable debate by our Board of Directors in May of 1986. These guidelines assure fair play by both sides. They also assure that federal funds are disbursed to trained qualified testers and that the funds will be spent on authorized activities.

Secretary Pierce of the Department of Housing and Urban Development has agreed to proceed with regulations based on these guidelines as part of the testing program, and has given his assurance that the guidelines will govern both funding and program performance under the testing portion of the Fair Housing Initiatives Program.

Mr. Chairman, as I previously mentioned, the the ASSOCIATION'S Board of Directors approved the guidelines this past May, but with one stipulation, that the guidelines be included in the statutory language authorizing FHIP. This was prompted because of a genuine concern among our members that the regulations and the guidelines might be changed by the direction of a future

HUD Secretary, thus our emphasis on the statutory language itself. We advocated this position through 1986 and continue to advocate this position today.

However, in an effort to "break the logjam" which contributed to the prevention of passage last year, our Board of Directors moved to meet the objections of several members of Congress.

Even though the ASSOCIATION would still prefer that the guidelines be included in statutory language, we nonetheless offer an alternative in the spirit of reasonableness: that FHIP be authorized as a demonstration program -- at a spending level of around $3 million per year -- that would automatically sunset after 2 years. We would no longer insist that guidelines be written in the statute, but would request that the substance of the understanding--that HUD would implement the guidelines for a period of two years following enactment--would be included in Committee reports accompanying the statute. In short, FHIP, the guidelines and the regulations would be sunsetted after the two-year period. Congress and whatever Administration is in office two years after enactment would then presumably wish to review the actual experiences with this program and act in the future accordingly.

We believe that the dual sunsetting of the FHIP program and the guidelines will prove useful to the Congressional debate surrounding the guidelines. By allowing the FHIP program and the guidelines to be a demonstration then you, the Congress, can determine whether or not the guidelines proved effective for responsible testing programs.

As real estate practitioners, our position on FHIP has always been premised on the belief that we should be afforded the same kind of protections that others in our society receive. Are those being tested at risk without even the allegation of a wrongdoing? Are the testing procedures fair? Are the testers independent and qualified? The proposal we recommend would aid in producing the right answers in the interest of all concerned and involved.

Mr. Chairman, we do not want to be placed in a position of opposing the Fair Housing Initiatives Program, but if we cannot receive satisfactory assurance that the guidelines will be included in statutory language or that FHIP will be authorized as a demonstration program, then we will have no alternative but to oppose the enactment of FHIP into law. Rather, we earnestly hope that you would support this viable alternative.

FHA MULTIFAMILY ISSUES

Mr. Chairman, I would now like to address three issues dealing with federally-assisted multifamily housing programs in which the NATIONAL ASSOCIATION OF REALTORS® and its affiliate, the INSTITUTE OF REAL ESTATE MANAGEMENT (IREM), take interest: Prepayment of FHA-Insured Multifamily Project Loans, Multifamily Housing Preservation Loans, and Tenant Participation in Multifamily Housing Projects.

By way of background, IREM currently has approximately 3,900 Certified Property Managers® (CPM) managing 30 percent of this Nation's multifamily residential housing for a total of 11 million units. Of these units, IREM members manage approximately 1.2 million federally-assisted units.

Prepayment of FHA-insured Multifamily Project Loans

In the mid-1960's, the federal government began to use private ownership as a vehicle to provide subsidized multifamily housing for lower-income families. Through programs such as the SEC. 221(d)(3) Below-Market Interest Rate (BMIR) and the SEC. 236 FHA-Subsidized Multifamily Housing Program, the federal government provided a low interest-rate subsidy and a federally-insured mortgage to the owner who agreed, in exchange, to provide housing to low- and moderate-income tenants at below-market rents.

As an additional incentive, the federal government also constructed these programs so that many owners were contractually guaranteed the right to prepay the mortgage 20 years after the loan origination date and terminate the user restrictions in order to convert the property to other purposes. Since most of these privately-owned multifamily properties were developed between 1965 and 1975, particularly during the period between 1970 and 1975, contracts are now starting to approach the 20-year date by which owners may request permission from HUD to prepay the mortgage.

From 1980 through 1985, 12 projects containing 676 units had their restrictions to low- and moderate-income occupancy removed because of prepayments or voluntary terminations. According to HUD estimates, over the next 11 years, 2,715 projects with 306,198 units will become eligible for prepayment without HUD approval. In addition to FHA-insured projects, those units subsidized under SEC. 8 of the 1974 Housing and Community Development Act are affected through expiring rent subsidy contracts which were first written in 1975. According to HUD, approximately 100,000 of the SEC. 8 units in projects will be eligible for mortgage prepayment in the near future.

Although some project owners are expected to exercise their legal right to prepay the mortgage and use the property as they choose, HUD estimates as many as 75 percent of eligible project owners will not prepay primarily because their projects are now located in low- and moderate-income areas and their prospects for serving higher income markets would be negligible. For those projects which would prepay, some will still have SEC. 8 subsidies attached to their units. HUD expects that based on a very low activity of "opt-outs" in the past, many projects with SEC. 8 subsidies will continue until the contracts expire.

HUD is currently taking a case-by-case approach to requests for prepayments and will provide inducements for owners to continue the low- and moderate-income character of the project through rehabilitation programs. In its FY1988 budget proposal, the Department also plans to provide special assistance in the form of vouchers to tenants affected by prepayments and opt-outs.

The partnership between private owners and the federal government has benefited low- and moderate-income housing residents and has helped minimize the pressure on the supply of unassisted housing affordable to other low-income households. While the NATIONAL ASSOCIATION OF REALTORS® and IREM believe federal policy should work toward maintaining these relationships by renewing assistance contracts and providing appropriate inducements for continued participation by private owners, we oppose any attempts to change the terms of an existing contract by disallowing an owner's right to prepay their multifamily housing loan. Any retroactive action to disallow an owner's contractual right to prepay a multifamily loan would have the effect of eliminating any possible future incentive for the private investor or owner to participate in federal housing programs.

At the same time, we believe options should be explored whereby the needs of the tenants can be met while maintaining the legitimate rights of the owners to dispose of their properties. Mr. Chairman, we look forward to working with subcommittee members and staff in achieving this goal.

Based on a 1984 study, it is estimated that the value of the existing stock of SEC. 221(d)(3) BMIR, 221(d)(3) rent supplement, and SEC. 236 projects is as high as $10 billion. It is essential that this significant investment be preserved. With the provision of a comparatively modest capital improvement loan program, billions of dollars in badly needed low- and moderate-income housing stock can be saved.

Since 1975, the ASSOCIATION and IREM have been concerned with the lack of proper replacement reserves for federally-assisted multifamily properties. HUD has made efforts in this area, however, the capital improvement needs are escalating at a rapid rate.

Allow me to relate some data that better describes this problem. IREM research conducted in the fall of 1983 on SEC. 221(d)(3) BMIR and rent supplement indicate that 79.7 percent of the units had actual current needs for capital improvements. Management experience shows that a building 15 years or older begins to require major capital improvements. Other industry data for the same projects, aged 15 years between FY1979 and FY1987, indicates that 94 percent of the units have heating/air conditioning, plumbing/electrical, and roofing capital improvement needs. I would like to point out that while there may be other sources available for financing these capital improvements, they are not really viable alternatives for these subsidized projects.

First, the existing 241 Loan Program, which provides a second mortgage, has proved too burdensome and unworkable. Second, conventional financing is rarely available for these projects. Banks are very reluctant to lend because the property is unable to generate the earnings necessary to manage a market rate interest rate. Third, the existing flexible subsidy program is also unworkable for these projects because of the mechanics of the program and the constraints which are placed on the property owners. Finally, I have previously testified about the lack of adequate replacement reserves to fund the capital improvement needs of these projects.

In conclusion, there simply is not an adequate source of funding to preserve these subsidized units. Practically, owners cannot provide total funding of capital improvements without outside financial sources.

Consequently, the NATIONAL ASSOCIATION OF REALTORS® and the INSTITUTE OF REAL ESTATE MANAGEMENT support the concept of a capital improvement loan program; however, we cannot support the Multifamily Housing Preservation Loan provision as it has appeared in House housing authorization legislation since 1984, and as it is currently written in H.R. 4, the Housing and Community Development Act of 1987. We, therefore, respectfully submit the following comments to the Subcommittee on four specific provisions of this proposal contained in the House bill.

Realizing the limited financial resources of owners, the constraints placed on the rent increases in federally-assisted projects, and the limited cash flow to owners of these properties, we believe that the majority of the owners would find it difficult to provide a 20-percent downpayment on a capital improvement loan. Because of these constraints, there will be cases where owners will need 100 percent of the loan available from the federal government.

We would prefer the elimination of any owner downpayment requirement; however, a 10 percent downpayment on a capital improvement loan rather than the 20 percent requirement would be more reasonable. Also, the language giving HUD the ability to waive the downpayment requirement should be added.

We do not believe that the owner should be required to maintain the property as low- and moderate-income beyond the existing requirement specified by the regulatory agreement. The owner will be contributing to the capital improvement costs, and has made a significant investment in the property for current and future residents.

We would prefer that the language be altered so that the owner is only obligated to maintain the low- and moderate-income nature of the project until the term of the regulatory agreement. However, if this cannot be accomplished we recommend the following:

"If the capital improvement loan is applied for by a given owner/agent for a specific property, the low- and moderate-income character of the project would be maintained until the maturity date of the capital improvement loan."

For example, our concept of this loan would be a five to seven year (short-term) loan. Therefore in this example, the low- and moderate-income character of the project would be extended from five to seven years beyond the current term of the low- and moderate-income nature of the property.

We support the Secretary of HUD exercising close scrutiny over the project's financial resources and requiring that the owner make contributions, through replacement reserves and other sources, toward the provision of project capital improvements. However, in determining the interest rate and duration of the loan, we recommend that a careful examination be made of the projects ability to repay the loan. In minimizing the cost to the federal government, we recommend that those projects which can manage a higher interest rate are provided a loan of this nature. The interest rate should be less than 6 percent only in those cases where the majority of tenants would be affected by significant rent increases.

While we realize the critical need for the proposed legislation in preserving the supply of low- and moderate-income rental housing, we also want to express our concern about funding new government programs which may add to the ever-growing federal deficit. We strongly recommend that this Congress consider, when possible, redistributing existing monies within current or previous HUD appropriations and recaptures, to fund the initial capital improvement loan program appropriation. This action is greatly preferred over appropriating new program monies. A danger always exists that a new program, despite its initial modest beginnings, will over the years grow into a major budgeted program. We would caution against this kind of a development.

Tenant Participation

After reviewing S. 2507, as reported by the Senate Banking Committee on May 23, 1986, the ASSOCIATION and IREM cannot support SEC. 223 of the bill, the provision on tenant participation in multifamily housing projects, as this is clearly an addition to the existing law as stated in the Housing and Community Development Amendments of 1978, Section 202 (a)(b) and (c).

The proposed section allows tenants in SEC. 202 housing to comment upon various areas in addition to the current law which allows tenants of SEC. 236 and 221 (d)(3) BMIR and rent supplement, or tenants of projects that have been sold subject to HUD-insured or HUD-held mortgages to provide comments.

It is proposed that these tenants be allowed to comment upon the transfer of physical assets, an application for capital improvement loan, and where the Secretary proposes to sell a mortgage securing a multifamily housing project.

Conversely, existing law allows tenant input on owner's requests for rent increases, partial release of security, conversion of residential units to any other uses (including commercial use or use as a unit in condominium or cooperative) or major physical alteration. We believe that these provisions conflict with the principles that comprise the rights of private property ownership. Moreover, this could discourage any future investment in such housing, as investors would have to take into consideration the input of others before proceeding with decisions affecting the property.

It is important to note that the proposal for inclusion of "transfer of physical assets" was removed from the Housing Act of 1978 (via amendments passed in 1980,) and that language specifying, "where the Secretary deems it appropriate", was added at that time. These practical changes were the result of efforts to relieve project sponsorship of burdens that would be tied to the managerial process.

These restrictions on owners could create disincentives for the construction of new multifamily projects, and may eventually affect all forms of HUD property. Tenant input on management issues adds to costs and delays the management's effective and timely decision-making. Additionally, because mortgage and regulatory contracts do not include provisions for tenant participation, the implementation of this statute will have the retroactive effect of altering many existing contracts. In a time when tax reform changes and deteriorating physical conditions already have had a negative effect on the ownership of federally-assisted properties, we recommend that Congress not add disincentives to the ownership of federally assisted properties.

The following examples depict how tenant comments have delayed the decision-making process or have had an effect on multifamily property:

In California, tenants of a 575-unit 221(d)(3) BMIR project submitted letters on the 29th day of a required 30-day period to comment on a posted rent increase. Because HUD must review these letters, it pushed the procedure back another 30 days. The rent increase was given; however, because of the delay, the rent increase did not provide the operating income needed for the first 30 days as requested. Rent increases cannot be given retroactively.

In a 400-unit 221(d)(3) BMIR project, located in Virginia, the partners of a property requested a 30/unit rent increase to fund various property improvements that were needed. They had already put up $500,000 for these improvements. The rent increase was posted, and during the 30-day review period the owner claimed that the notice was removed anonymously from a bulletin board. Because it was not technically posted for 30 consecutive days, the rent increase was delayed another 30 days. This 30 day delay cost the project additional rent that was not recovered, because rents are not retroactive.

The phrase "where the Secretary deems appropriate" should be left as it currently exists in the legislation, and we would urge that Congress examine the impact of the 1978 Housing Act, as it relates to tenant participation, on the inventory before it changes the current tenant participation legislation.

LEAD-BASED PAINT HAZARD ELIMINATION IN GOVERNMENT-ASSISTED/INSURED HOUSING

One final matter that the ASSOCIATION would like to provide some input to the Subcommittee concerns the issue of lead-based paint hazard elimination in government- assisted and government-insured housing. As the Subcommittee members are probably aware, the Lead-Based Paint Poisoning Prevention Act was amended in 1973 in order for HUD "to establish procedures to eliminate, as far as practicable, the hazards of lead-based paint poisoning".

Although a Senate housing bill has not yet been introduced, we believe it is important to raise this subject with this Subcommittee, for the housing bill under consideration in the House does contain lead-based paint provisions. These provisions would impose substantial costs to property owners and threaten the viability of federally-assisted multifamily housing programs and potentially, the FHA single-family mortgage insurance program.

While the ASSOCIATION opposes any change that substantially threatens the continued availability of these important programs to the public, we certainly recognize that lead poisoning can be a serious public health problem and that lead-based paint can contribute to this problem when ingested by children. To further address this problem, HUD promulgated, in January of this year, new regulations which establish strict program-specific requirements to eliminate immediate hazards associated with lead-based paint. These regulations will impose substantial new costs to property owners, yet maintain the practicability standard established under the Act. In light of this recent action by HUD, we believe it both inappropriate and unnecessary for Congress to take further action at this time.

CONCLUSION

Mr. Chairman, I appreciate the opportunity to present the ASSOCIATION'S views on these key housing issues, and will be pleased to respond to any questions you or the Subcommittee may have.

Statement of Assemblyman David Schwartz, Representing the National Conference of State Legislatures

Good morning, Mr. Chairman and distinguished committee members. My name is David Schwartz. I am a member of the New Jersey Assembly and the National Conference of State Legislatures (NCSL). I currently serve as Vice Chair of the newly established NCSL Task Force on Housing. I welcome the chance to share the views of the nation's 50 state legislatures with you.

The National Conference of State Legislatures calls for a reaffirmed national commitment to meeting the housing needs of the American people. We recommend a coordinated effort by federal, state and local governments, together with the private sector, to achieve the goal of decent housing for all Americans.

The legislation you have before you, in my judgment, is partly consistent with the recommendations by NCSL: the level of funding you are considering does reaffirm a national or federal role in housing -- at least in that the massive cuts of recent years in assisted housing and related programs are not continued in this legislation. And this legislation does recognize some state-level and local initiatives, for example in the funding of Nehemiah Housing Opportunity Grants. To the extent that S.825 and the appropriations legislation to support that bill do affirm a national commitment to affordable housing and do afford state and local governments a cooperative role to play in providing needed housing, I and NCSL commend you, and the Congress, on the development of this legislation.

Congress is moving in the right direction with the continuation and creation of an important number of housing programs, which will make certain that shelter remains affordable for many Americans. Among programs to be commended in this act are:

- the 3.8 percent cap on FHA mortgage premiums, and the prohibition of user fees for FNMA and FHLMC as well as a cap on GNMA mortgage-backed securities fees,
- the Neighborhood Development Demonstration Program, which will help non-profit and community-based organizations revitalize our state's neighborhoods, and
- the Nehemiah Housing Opportunity Grant designed to assist families with single family housing in depressed areas of the United States.

Also, I want to give strong support to the Community Development Block Grant Program.

But this legislation, in my view, is far too limited, far too limited in the funding levels recommended and in the scope and flexibility of programs envisioned. This year's Federal housing legislation does not meet the massive and mounting housing needs of our people, does not mount a concentrated attack on declining levels of homeownership in America, does not adequately economize or challenge the state governments increasing commitment to providing affordable housing. Mr. Chairman, please allow me to make a few observations which, even if they cannot feasibly be incorporated into this year's bill, may be useful to your thinking for either supplemental legislative action or for future years.

For the past 6 years we have witnessed a declining rate of homeownership in America, a decline in both the quality and affordability of rental apartments in America, a severe, even critical shortage of apartments affordable to low income families and a burgeoning of homelessness. To address these problems, the legislation you have before you sets federal funding at levels generally well below those of 1982.

If the cutting of Federal housing support is, for this year at least, stopped - that's good: but, as for meeting the housing needs of our people, or challenging the state and private-sector to meet those needs, it's not good enough.

Let's look at the state of the housing in America, to decide if a restoration of funding below 1982 levels is likely to begin to be sufficient.

First, American homeownership levels are declining and have been falling every year since 1980. Before then, homeownership had risen steadily for 35 years.

An important recent study conducted by the Joint Center for Housing Studies of the Massachusetts Institute of Technology and Harvard University documented the decline in homeownership in America. The study indicated that since 1981 the percentage of homeowners in the 25 to 29 age group fell by almost one percent each year. Similarly, for those between the ages of 30 and 34, homeownership has dropped from 59.3 to 54.7 percent in the past half-decade. For young families, homeownership levels are well below those of the 1970's.

Part of the reason for the decline in homeownership in the 1980's is, of course, the skyrocketing costs of buying and maintaining a home. Homeownership cost burdens remain at three times that of the 1970's. The impact of these costs means today's young families confront barriers to homeownership that previous generations simply did not have to face. Figures from the Urban Institute and other national sources make this point graphically:

- in 1959, a typical 30-year old paid 16% of his income for the average home,
- in 1983, that 30-year old paid 40% of his income in mortgage payments. Today, according to some analysts, that 30-year old would be paying 44% of his income for housing.

The problem exists not just for young families, but for all first-time home-buyers or would-be home-buyers. In the 1980's homeownership levels declined for almost every age group in the American population. Statistics relating to the size of downpayments relative to income illustrate the problem. In 1978, the typical home-buyer had to make a down payment of about one-third of his yearly income to purchase his home by 1985, that share had risen to 50%. As Anthony Downs said in a recent Brooking's Institution publication, "the percentage of all potential first time home-buyers who can actually afford to purchase homes at today's interest rates and prices is much lower than it was in the 1950's and 1970's."

While the costs of home ownership are perhaps most consequential in blocking achievement of the American dream for young families and first-time home-buyers, the total cost of home ownership today has other negative consequences. In 1985, the mortgage default rate was almost one percent of all existing mortgages, the highest level since the early 1970's. The foreclosure rate has nearly doubled since 1980. The MIT/Harvard study calls this "a large and growing problem of mortgage default and delinquency for the United States." Millions of families can't buy a home and too many Americans can't keep the one they've got.

There is a severe housing problem among renters as well. Median rents in our nation have risen from 20% of income to 30% and higher in the 1980's. This increase far outstripped inflation and even farther outstripped the real wages of our people.

The key problem is that America's tenant population disproportionally is made up of people who can least afford dramatic housing cost increases -- low-income persons, single parents, and minorities. For low-income renters, the recent past has meant disastrous cost increases; they saw the amount of their incomes spent on housing go up from 35% in 1974 to 46% in 1983. In 1985, 47% of low-income renters (7,000,000 families) spent more than half of their incomes on rent, while 13% of all tenants pay more than 75% of their income on rent.

A major reason for these high, unaffordable rent increases is a lack of supply, and it is to this problem that considerable policy attention must be paid. A recent national study by the National Low Income Information Service showed a shortfall of almost 4,000,000 apartments in America. That study also showed that every state had a shortage of affordable apartments. Worse, every state had a more severe shortage of affordable apartments in 1985 than it had in 1980.

Beyond the unaffordability of apartments, the number of tenant households living in substandard shelter actually increased by seven percent in the 1974-83 period. In that decade the number of Americans living in inadequate shelter grew from 3,600,000 to around 3,900,000. Although 5,000,000 new multi-family units were built between 1975 and 1985, the number of structurally inadequate rental units actually increased. For every 100 units of dilapidated apartments withdrawn from the housing market in a typical decade, 107 apartments slip into inadequacy; and nearly 500,000 lower-rent apartments disappear each year -through building conversion, arson, abandonment, inflation and demolition.

In the face of these problems, and the national shame of homelessness, federal budget authority for low income housing programs has been slashed by 60% or more. At the same time, state governments have increased their commitments to decent housing.

A 1986 Council of State Community Affairs Agency (COSCAA) survey found states had undertaken such innovative approaches. COSCAA reported that out of the 42 states surveyed, 119 new housing initiatives had been implemented since 1980; a multibillion dollar commitment.*

* Fifteen of the states have adopted housing trust funds -- dedicating stable permanent revenue sources to stimulate affordable housing. The states have adopted programs to meet 10 different diverse housing needs. These include providing financial assistance for new construction of housing, providing financial assistance for the substantial rehabilitation of existing, substandard housing units, granting rental assistance for low and moderate income families, expanding homeownership via downpayment assistance and/or interest rate buy downs, meeting the special needs of elderly and handicapped citizens, providing financial assistance to local governments and non-profit housing sponsors for land acquisition and development.

The states have sought new partners, and many different revenue sources, in their quest to cope with housing problems. State, county, and local governments have gotten more sophisticated in working with corporate, foundation, and non-profits housing sponsors.

To meet the housing needs of the 1980's state and local governments have used general fund revenues, general obligation bonds, taxes on real estate title transfers, offshore oil revenues, casino taxes, and racetrack revenues -- we have diversified our search for funding sources far beyond the traditional mortgage revenue and industrial redevelopment bond vehicles. This year, or next, states will issue taxable bonds and new housing securities.

Not counting MRB's or IRB's, states (with all of the limitations on their tax bases) will have spent more than 3 billion dollars of tax and bond revenues to meet housing needs of the 1980's.

The states can't go it alone, of course. We need strongly enhanced Federal assistance. But we are now ready to use such assistance in new and better ways, we are now ready to help shape the assistance we need. Mr. Chairman, I urge you and your distinguished committee to look at our state-level initiatives; I urge you to consider these workable state-level initiatives for application at the national level. I urge you to help make the spending programs you support more flexible so as to better coordinate with state programs. I urge you to create a new, more robust Federalism on housing policy. I urge, and NCSL urges, you to help forge a new joint Federal/State housing partnership -- a truly coordinated effort, together with the private sector, to achieve the American dream.

Thank you, Mr. Chairman and committee members for the opportunity to share with you the perspective of the nation's state legislatures. I look forward to working with you in resolving this pressing problem as a fellow legislator and Vice Chair of the NCSL Task Force on Housing.

STATEMENT OF NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY

Mr. Chairman, Members of the Subcommittee, my name is Joe Sedlak. I am the President of the National Center for Appropriate Technology (NCAT). NCAT is a private, non-profit corporation created by Congress in 1976 to transfer appropriate technologies in energy efficiency, renewable energy, agriculture and community economic development to the American public. NCAT is a recognized leader in the research and development of low-cost, energy efficient housing designs. I am here today to recommend an appropriation for a pilot program authorized in House Bill 4, the Housing and Community Development Act of 1987.

NCAT recommends that this Subcommittee appropriate $4.7 million in FY 1988 for the pilot program in design and construction of 100 homes for Northern climate public housing. This program will bring proven energy-efficient technologies and methods to new public housing in a way that ensures substantial energy savings while training local personnel to use the new methods. The program includes $2.5 million for plan design, education and training, and administration; $1.7 million for on-site energy consumption research, evaluation and analysis; and $500,000 for local administration and staffing. Estimated minimum energy savings from the project is $1.2 million.

Significant energy savings and operations cost reductions are possible in new single-family and multi-family public housing through the use of new technologies and methods that provide greater value at lower cost. Yet, few of these innovations have been effectively transferred to either private or public sector housing, resulting in unnecessarily high annual operation costs. NCAT recommends that a pilot program initiate this transfer process to safely and effectively bring these improvements to new public housing starts.

Large field demonstrations have shown that energy efficiency improvements in new construction can save a minimum average of 45 percent of the space heating energy required by dwellings built to Housing and Urban Development (HUD) current practice. Yet, these energy savings are not presently realized in new public housing starts built to current HUD Minimum Property Standards. New public housing can be built immediately with these energy-saving features at no extra cost over current cost containment limits. If the transfer process is not initiated now it easily could take more than a decade for these improvements to be generally available to the government in public housing starts, due to the decentralized nature of the housing industry. The principal obstacle to technology transfer in this regard is the lack of information, education, and documentation. In general, the housing community needs proof that such achievements are indeed possible.

Substantial public resources have been invested in the study of affordable housing, as well as in the research of energy efficiency improvements. However government is not yet realizing the benefits that are possible through the combination of these two goals. NCAT recommends that the Subcommittee set in motion now the process by which these goals can be achieved in the near term in public housing starts. Each passing year at current construction levels without such an initiative results in an estimated $1.5 million in unnecessary annual energy costs added to the public burden.

A key to this initiative is the development of correctly engineered and detailed statements of technology that allow builders to correctly employ the new technologies. Past attempts to change current practice to introduce energy efficient methods have often failed or produced less savings than expected because builders were asked to make changes that were beyond their comprehension, or programs relied on technology that was unavailable. Builders are often asked to "field engineer" changes to incorporate new methods, when they, instead, need simply to be shown a workable, cost-effective approach. The backbone of the proposed pilot program is to develop these workable approaches for a wide variety of settings.

To document the savings and the approach, the House Bill calls for a pilot program for 100 new public housing units across the Northern Tier. The first phase of the project will be to work directly with regional and local housing officials to determine the final location of the field work, focusing on constructing 25 units per state in four states. States chosen to be part of the program would be determined by need for the units, documented long-term interest in providing follow-up for possible expansion to a demonstration-scale project, and documented ability to coordinate with other state agencies and private-sector groups toward the final goals of the effort.

The program may be able to expand on the results of a successful pilot program conducted by NCAT in the State of Montana. This pilot, with five houses, produced annual average savings of more than $600 per house (at Montana's low energy costs). This pilot project employed a unique tool - a detailed house plan that allowed builders of all experience levels to correctly employ the new methods in a highly cost-effective fashion.

In order to meet a variety of local needs, at least five types of housing - ranging from single-family detached to twelve-plex - will be developed. The designs will be applicable for use on vacant urban lots, as well as more spacious locations. The public housing authorities who qualify for the program would work as part of an interdisciplinary team with NCAT to ensure local needs are met, and to gain the experience that will allow successful results to be replicated in the future. Local training and information efforts, with an emphasis on low-income job creation and technical assistance to small firms, would be a key aspect of the project.

Another major aspect of the project will be to produce designs and local planning that will allow each unit to be part of a cluster designed to meet the needs of the end-users of the housing, such as single-parent households, or elderly tenants. This goal allows for reduced costs over large-scale housing projects, while providing for increased training opportunities on the local level. Each unit will be monitored for cost, energy performance and occupant acceptance and reaction. Detailed monitoring of new technologies and approaches will also be part of the project, to allow for further field verification of cost-saving technologies.

The project will produce usable, replicable designs and plans that embody the substantial research and development that has already been done in the United States and abroad to enable builders, no matter what their experience level, to learn about and use the new methods and technologies. These plans would be immediately useful to other federal self-help housing programs, as well as to owner-builder groups across the Northern Tier. In addition, the project will produce training and information materials that can continue to expand program results on the local level. Finally, the research aspects of the project will provide much-needed guidance on the integration of methods and designs that can improve the quality of housing for all Americans.

In the design of the proposed project, NCAT has developed a three-track approach to obtaining the greatest possible savings from the technology transfer of new technologies and methods.

First is information. In previous programs, NCAT has seen how simply providing useful information can result in both energy and construction savings when the audience is ready to employ conservation but has not been given the technology education needed to implement it.

Second is more detailed education. The proposed program includes the development of a new generation of detailed construction plans that NCAT has found result in both construction cost savings and proper application of new technologies and methods. In addition, the education component will include on-site and one-on-one education of program participants, allowing them to use newly acquired skills for future projects.

Third is detailed field research, which guarantees a full evaluation of all aspects of the program as well as insures that energy savings are achieved. Through past experience, we have found that the research segments of our integrated projects typically uncover a variety of new savings possibilities that can be included in future efforts.

This three-track approach to program design tends to make for substantial program savings in a variety of ways, both during the program and afterward. Our experiences in the last six years indicate that the detailed engineering, design and documentation behind the generic house plans provides for substantial savings for any user of the plans. It is anticipated that the plans developed in this project would be of immediate use for future HUD low-income construction efforts as well as the Farmers Home Administration self-help program. Thus, energy and construction cost savings would accrue to a much wider group than the original 100 units built under the proposed pilot.

However, none of these potential and likely savings are reflected in the estimated program savings of $1.2 million stated for the 100 units in the project. This figure represents an estimate of energy savings possible over the 20-year lifetime of the units from energy conservation improvements in space heating and domestic hot water heating. Based on the previously mentioned pilot program, we have estimated that an average of $600 annual savings per unit is achievable.

The completed pilot in Montana indicated that occupants have a wide range of preference in indoor temperatures and hot water consumption. Hot water heating and space heating together consumed, on average, 43 percent of the energy. These savings estimates are conservative and even greater energy savings would result through the selection of appliances, which consumed an average of 57 percent of the total energy load in the first year of the pilot program. Therefore, NCAT is confident in the program's ability to deliver at least $1.2 million in energy savings from the 100 units in the program, and given all aspects of the program, it is safe to assume that this would be minimum savings possible through the proposed pilot.

NCAT recommends that this Subcommittee set in motion a program that is aimed at reducing the energy cost burden of new public housing, while providing quality, appropriate housing for low-income Americans.

Thank you for your time and attention.

STATEMENT OF THE NAVAJO NATION

The Navajo Nation is pleased to have the opportunity to submit a statement for the record on Housing. Housing is a first priority of Chairman Peter MacDonald and the Navajo people for a number of reasons. Navajo's population characteristics and emerging demographic trends demand better housing. Currently, Navajo is in need of 30,000 units of new public housing; 50 percent of the required amount in all of Indian Country. The average age of the Navajo population (17.5) and the increasing birth rate (4 percent annually) will drive the need for even more units. Historically, Native Americans have lived in substandard housing -- often dwelling in homes that are not equipped with the most basic of human needs -- water and electricity. In a nation as stable as the U.S., this is unacceptable. Public housing is critical to Native Americans because of the lack of a private housing market on the reservation. Finally, in Navajos' quest for economic self-sufficiency there must be adequate housing on the reservation for professionals willing to relocate.

The current Administration has shown indifference to the Indian Housing program. Only Congressional action and advocacy has kept the program from termination. The Administration had proposed zero units of Indian housing for a number of years. However, Congress usually authorizes approximately 2,000 units of Indian housing. This year the Administration proposed 1,000 units for Indian families. This would represent a 59 percent reduction from FY 1987 funding levels. The levels of new units contained in the Administration's proposal, and in the Housing bills moving through Congress are not adequate. At the level of 2,000 units per year, it would take 30 years to meet the requirement of 60,000 units that the Bureau of Indian Affairs estimates needed on Indian lands if population levels are to remain static. This has not been the case in recent years.

SEPARATION OF PUBLIC AND INDIAN HOUSING

Currently, the Indian Housing program is grouped with the Public Housing program (Section 8). This constitutes illogical and inadequate public policy. The rules and regulations that govern housing programs in New York, Chicago, Philadelphia, and any other participating urban area also are applied to Window Rock, Arizona. It is not appropriate for these programs to be grouped together as the demographics of the service population and market characteristics of the different economies are entirely different.

The Navajo Nation's past experience with the Public Housing program should provide ample justification for creating a separate program to meet the needs of Indians. As mentioned earlier, the Navajo Nation requires 30,000 units of new HUD housing to adequately meet the needs of tribal members. However, for two consecutive fiscal years (1984 & 1985) Navajo did not receive one unit of HUD housing, even though HUD justified its budget based on Navajo needs. This is wrong.

The reason for this development is simple and when carefully examined, should be an impetus for major changes in the Indian Housing program. HUD allocatd Indian housing based on six criteria that are part of an overall management assessment -- the Administrative Capability Assessment (ACA). Tenants Account Receivable (TAR), which accounts for 16 percent of the ACA, is the amount of rental delinquencies that tenants owe to Indian Housing Authorities. The Navajo Nation's rental delinquencies were over the limit that HUD and the tribe had negotiated and therefore, Navajo received a very poor score on 16 percent of the assessment which lowered its overall management performance. The low score has little to do with the Navajo Housing Authority's capability to effectively manage programs, but points out the shortcomings of HUD's allocation crtieria.

Those people utilizing public housing are required to contribute 30 percent of their Adjusted Gross Income (AGI) to rent. As a tenant's income increases so does his or her rent commensurate with income. The purpose of the AGI provision is illogical in a public housing context. The AGI provision works to increase rent in proportion to salary, even though the quality of housing remains the same. This development should provide the tenant with an incentive to search for alternative housing, preferably in a private market. The incentive to find alternative housing is more disposable income to those utilizing public housing.

There is one small problem as this policy relates to Indians, specifically the largest tribe, the Navajo Nation. There is no private housing market in the Navajo Nation. Thus, if tribal members want alternative housing they have to move off of the reservation. As a tribal member's salary increases, so does their rent regardless of the quality of their dwelling. Those Navajos who do not want to move from their family and friends on the Reservation have become discouraged and have stopped paying their rent. This development is an irrational zero-sum game. This policy has led the Navajo Housing Authority to be graded poorly in its management capability and has prevented the

Nation's largest Indian tribe from receiving housing for two years.

In our opinion, becuase of the different circumstances of urban areas and Indian reservations including demographics, market characteristics, and the special needs of Indian reservations and Indian people, there should be a separation of Indian housing from public housing. The Department of Housing and Urban Development has proposed such a program and we urge the members of this committee to support this initiative.

CONCLUSION

In the decade following the Great Depression, a national consensus was reached that adequate shelter was not a privilege for the rich, but a fundamental right that everyone living in this country should be entitled to. However, America's first citizens still live in substandard housing.

There are two basic problems with Indian housing. Either Indians still live in substandard housing or there is not sufficient numbers of housing units available for those who are fortunate enough to have a home. In a country as rich as ours, this is unacceptable. The Navajo Nation urges the Appropriations Subcommittee on HUD and Related Agencies to allocate an adequate number of units and to support changes necessary to improve the housing program serving Native Americans.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF JAMES HIEATT, CHAIRMAN, AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS

Senator PROXMIRE. Our next witness is James Hieatt, chairman of the American Institute of Aeronautics and Astronautics. Mr. Hieatt?

Mr. HIEATT. Thank you, Mr. Chairman. The AIAA thanks you again for inviting us so we can give you our thoughts on the NASA budget. Much of the testimony that we submitted in writing is based on a workshop that we held last year. I have a report from that workshop that I would like to request be included in the record.

Senator PROXMIRE. Without objection, it will be printed in the record.

[The report follows:]

U.S. CIVIL SPACE PROGRAM: AN AIAA ASSESSMENT

Approved by the AIAA Board of Directors

Edited by Jerry Grey, Stanley Rosen, Johan Benson

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PREFACE

The U.S. civil space program faces a crisis. The Shuttle, Titan, and Delta launch failures, the reports of the Presidential Commission on the Space Shuttle Challenger Accident and the National Commission on Space, the growth in overseas civil space activity, the domestic drive to eliminate the federal budget deficit, and the growth in emphasis on commercialization collectively pose a major challenge which must be addressed if the U.S. is to maintain a vital civil space program. The AIAA believes this crisis calls for a reassessment of that program.

This analysis consists of a summary and a detailed discussion of both urgent (near-to-mid-term) and selected long-term issues affecting the U.S. civil space program. These issues are presented here in four categories: restoring momentum, maintaining space leadership, organizing and managing the civil space program, and building for the future.

This paper has been approved by the AIAA Board of Directors. We hope it will be useful in determining the future course of the U.S. civil space program.

SUMMARY

I. Findings

It is imperative that this nation maintain a leadership role in space. A strong civil space program is essential to continued national vitality and successful foreign relations. However, the events and circumstances of 1986 lead the AIAA to conclude that the U.S. civil space program no longer has the support needed to maintain its former preeminence. This condition cannot be corrected overnight, but vigorous action backed by firm commitments *can* restore U.S. leadership in space.

The first requirement is a unified national policy which sets clear long-term objectives and makes firm commitments to their implementation. The Soviet Union, Europe, Japan, and China have made such commitments to strong space programs; U.S. preeminence cannot be re-established, nor can the U.S. participate properly in global space activities, without comparable action. There is, however, a fundamental inconsistency in attempting to achieve U.S. preeminence in space with budget policies under which civil space program funding declined sharply (in real terms) over the past two decades. If the U.S. elects to be a leading space-faring nation and to commit itself to a coherent national space plan commensurate with that objective, with the necessary space infrastructure such a plan implies, the civil space budget must be increased as rapidly as practical to a level required to support such a plan – approximately 40% greater than the present FY 87 civil space budget – and then grow at an average rate at least equal to that of the gross national product. The budget policy of the past two decades will ensure that the U.S. becomes and remains a second-class power in space. If space preeminence is a national objective, the choice is not simply to select among fixed-budget alternatives, as has been done in the past, but to formulate an achievable set of national civil space goals with measurable milestone objectives and then commit the funding needed to proceed with all the necessary actions at a pace commensurate with the attainment of those goals.

It is particularly important that those responsible for government budget policy establish a proper balance between investment funding in areas such as space, which creates future capabilities, and non-investment or sustenance funding. Both are essential, but the relative resources they receive should be adjusted to recognize that investment funds create additional wealth that can be used to pay for other essential functions without adding to the national debt.

The national perspective necessary for supporting such an approach does not exist in the administration's present policy-setting structure. A dedicated body is needed to formulate national policy independently of parochial agency interests. Whether that body takes the form of a reconstructed National Aeronautics and Space Council, a new cabinet-level department, or other organizational structure, it must have direct and timely access to the President. Its most urgent task is to assemble a firm long-term plan for the U.S. civil space program that sets goals, defines budgets, and provides for continuity.

U.S. space leadership is currently at stake in several areas. With so few U.S. launch vehicles currently operating, foreign launchers dominate the market. Although the growing backlog of payloads and limitations on Ariane and Chinese launch rates indicate a shortage of launch capacity for several years, the picture beginning about 1992 could be very different. Unknowns that could affect the situation include reductions in projected demand (including the effects of increasing launch prices and upgrading satellite performance and useful life), an apparent revision of the Soviet role in commercial and foreign launches, availability of the advanced Japanese H-2 launch vehicle, increased Ariane capacity, and the nature of new mixed-fleet U. S. launch capabilities. Hence the U.S. must have in place by 1992 the assets needed to meet foreign space launch service competition.

Space leadership is also at stake in other commercial space activities. Strong foreign initiatives in space processing, satellite communications, and remote sensing are not being adequately matched by U.S. programs, primarily because of inadequate support for technology advancement and research facilities. There is also insufficient attention being given to the encouragement of government-industry-university cooperation, and there continues to be confusion in defining policies for commercial space ventures.

The highest immediate priority in reestablishing U.S. preeminence is to regain regular access to space. The AIAA strongly supports the recommendations of the Challenger commission in restoring the Shuttle to service, recognizing, however, that space flight activities will always involve some degree of risk. Methods for reducing this risk (for example, the now-moot proposal for vertical solid rocket booster testing, whose technical benefits were questionable, and for provision of crew escape mechanisms) must be assessed in the light of their costs and the delays they might entail in resuming flight operations. Safety, of course, remains the predominant consideration, requiring that rational consideration of risk reduction and mitigation techniques be given strong emphasis in all relevant decision-making processes.

The long-term growth of space industry requires the availability of adequate launch capacity at competitive prices. The U.S. should continue to expand its launch capacity based on a mixed fleet of expendable and reusable launch vehicles to preclude total reliance on any one launch system, so that present manned and unmanned launchers will remain operationally healthy until the next generation of vehicles is fully developed. We support the decision to use the Shuttle as the primary launcher for payloads and missions that require its unique capabilities, but it should also be used as a backup for other payloads if a suitable U.S. expendable launch vehicle (ELV) is not available. Because it is still developmental, NASA should continue to operate the present Shuttle system, but plans should be made for transfer of its operations to a dedicated entity – private, quasi-government, or government – when the Shuttle is considered to be operationally mature.

In the interest of encouraging a commercial ELV industry there should be no artificial incentives for those commercial or foreign users still eligible for Shuttle launches to prefer the Shuttle over U.S. ELVs or vice versa. In the face of continuing international competition, U.S. policy on launch vehicles should support the goal of commercial space development, including but not limited to the development of commercial launch services.

We also support the decision to begin the procurement of a replacement orbiter and structural spares. They are needed to meet the projected demand for Shuttle missions (including the backlog that is now accumulating and the expected expansion in commercialization after the space station is available), even with maximum use of ELVs. Furthermore, launch capacity will continue to be limited by Shuttle down-time and turnaround schedules, even without another catastrophic loss. Hence subsequent replacement orbiters should be built to meet demand growth, as was recommended by the National Research Council on October 9, 1986.

The cancellation of Shuttle/Centaur reemphasizes the need for a new high-performance Shuttle-compatible upper stage, as was recognized over 15 years ago, and the continuing need for increased attention to all aspects of mission safety.

Future growth in space activity, both civil and military, requires early attention to the development of more capable, cost-effective, and reliable launch systems. Based on the joint DOD/NASA National Space Transportation and Support Study, the nation should proceed as rapidly as possible with the technology developments needed to select and define the preferred configurations for next-generation launch systems, including but not limited to airbreathing systems. Selection of such systems for development must be based on an integrated long-term national launch plan that best accommodates the sometimes disparate needs of both government and commercial users. Such a plan must be made independently of the present launch crisis and the constraints of short-term budget deficit considerations.

Perhaps the most urgent long-range issues facing the civil space program involve people. An essential ingredient in regaining and maintaining a vital U.S. civil space program is to restore the credibility and morale of those who manage and conduct it. Because success is the key ingredient in credibility and morale, quality assurance, reliability, and adequate logistic support must be accorded maximum attention, along with identification of achievable interim objectives and a concerted effort to create better public understanding of the real risks — and benefits — of space activities.

The future success of the space program, as with any long-term endeavor, depends on its attractiveness to the bright young people who will carry on its activities in future years. Every effort should be made to stimulate student interest at the elementary and high-school level and create incentives for faculty positions at universities, as well as to provide the educational materials and laboratory facilities needed in space science and technology. To encourage graduates to seek employment in space programs, stable funding is required to avoid the "boom and bust" cycles that have driven promising people to other fields

A permanently manned space station is important to both near-term scientific, technical, and commercial progress and to pursuit of long-term goals such as those proposed by the National Commission on Space; hence the program should proceed on schedule to meet the 1994 deployment date. However, NASA's program plan must have sufficient flexibility to phase in transportation support, user accommodation, and advanced technology in terms of both budget and schedule. In that regard, it is desirable to consider space-station approaches that accommodate the use of ELVs in addition to the Shuttle for deployment, resupply, and operations (including compatibility with European and Japanese vehicles), and to provide for emergency crew return, consistent with attaining initial operating capability in 1994. NASA should continue to seek maximum practical use of automation and robotics in the station design and to encourage both U.S. private-sector and foreign participation to the greatest practical extent.

Increased investment in space science is required, both for its intrinsic value to the nation and for its important role in subsequent technological development. It is essential that we continue to implement the long-term plans that have been formulated in these areas by the National Academy of Sciences and others. If the U.S. is to remain preeminent in space science, substantial budget growth will be necessary – of the order of 100% as soon as practical – as well as multiyear funding for economy and efficiency.

In space applications, primarily satellite communications and remote sensing, federal support of long-term technology advancement continues to be essential, even though these activities have been transferred largely to commercial operators. Specific actions include continued support of the Advanced Communications Technology Satellite demonstration program and implementing the existing agreement for transferring land remote sensing operations (Landsat) to the private sector.

Space technology advancement underlies any comprehensive future space activity. The present effort is also inadequate. Indeed, the present course is a status-quo caretaker path with no potential growth. New commitments are called for in key technologies such as propulsion, automation and robotics, flight computers, information systems, sensors, power generation, materials, structures, life support systems, and space processing. We support the recommendation by the National Commission on Space for a threefold increase in this relatively low-budget but extremely important area of space technology advancement, especially in view of strong foreign commitments to such technology development. NASA's Civil Space Technology Initiative is a step in the right direction.

With a vigorous, long-term commitment to space research and technology advancement, the U.S. can strengthen its activities in international cooperation. Besides its intrinsic value in generating scientific knowledge and stimulating technical growth, international cooperation also brings benefits of cost sharing, improvement in both trade and political relations, and expansion of commercial markets. Among many international opportunities (in addition to the space station) that seem especially attractive are a global consortium for civil earth observations having features similar to those of both Intelsat and the World Meteorological Organization's global weather service, and a U.S./Soviet agreement to proceed with a cooperative exploration and scientific study of Mars and other long-term science objectives. Attention must also be given to issues of global scope such as the growing danger of collision with space debris and the use of satellites for global education.

In all cooperative activities of this type, by far the best counter to foreign competition is to remain ahead in research and technology development. However, current technology transfer policy, aimed at preventing the leakage of unclassified technology, is considered by many to have adversely affected U.S. innovative potential. One action that could reverse this undesirable trend would be to continue efforts to reduce the Militarily Critical Technologies List to the minimum consistent with protection of vital classified information.

The AIAA has addressed these major issues along with a variety of others, both urgent and long-term, which have been highlighted so sharply by the space crisis of 1986. Their resolution will require a major reassessment of national policies to reaffirm U.S. commitment to leadership in space via a technically, politically, and financially sound civil space program.

II. Recommendations

Specific recommendations made by the AIAA in this Assessment are summarized as follows:

Restoring Momentum

(1) Recommendations of the Challenger Commission should be implemented to return the Shuttle to service as soon as possible, with safety remaining the predominant consideration.

(2) The Challenger should be replaced as quickly as practical, not 1992 as now scheduled, along with an appropriate spares replacement effort.

(3) Plans for subsequent replacement orbiters and spares should be provided, should demand growth warrant them.

(4) Launch pricing for those commercial and foreign payloads which qualify for Shuttle launches under present policies should not artificially favor either the Shuttle or commercial expendable launch vehicles (ELVs).

(5) The Shuttle should be made available as a backup if no suitable ELVs are available.

(6) Present mixed-fleet launch policies should be reexamined when the backlog has been reduced to make sure the U.S. remains competitive with foreign launchers.

(7) Government launch procurement policy should be such as to encourage commercial ELVs.

(8) Because credibility and morale are best restored by success, maximum attention must be given to quality assurance, reliability, and logistic support.

(9) Concerted efforts are needed to create better public understanding of the real risks and benefits of space.

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Maintaining Space Leadership

(1) To regain and sustain civil space leadership, NASA budgets should increase as soon as practical by 40% (over FY 87) and then grow at a pace commensurate with the gross national product.

(2) Science program budgets should be increased by 100% over those of the current year (FY 87), partly to accommodate the need for ELV launches.

(3) A balanced mix of manned, unmanned, and interactive (people plus automated and robot) systems should be used, depending on which is best suited to the task at hand.

(4) The Advanced Communications Technology Satellite program and other supporting technology programs in satellite communications should continue.

(5) The existing agreement transferring Landsat operations to the private sector should be implemented, and technology to support U.S. remote-sensing activities should be adequately funded.

(6) Funding for space technology advancement (currently less than 2% of NASA's budget) should be tripled.

(7) Multi-year funding should be made available to those civil space projects which require long-term commitments.

Organizing and Managing the Civil Space Program

(1) A dedicated space policy body should be established that eschews parochial interests and has direct and timely access to the President.

(2) Implementation of Challenger commission management recommendations should proceed as rapidly as practical.

(3) The government should set reasonable limits on third party insurance and should serve as an insurer of last resort if no private-sector insurance is available.

Building for the Future

(1) NASA should continue to operate the Shuttle, but plans to transfer operations to a dedicated entity should be made for implementation as soon as the Shuttle can be considered operationally mature.

(2) A high-energy reusable upper stage should be developed as soon as possible.

(3) Technology development required for next-generation space transportation systems should begin as soon as possible, following the general guidelines of the DOD/NASA National Space Transportation and Support Study.

(4) An International Space Science Board should be created to serve the same planning function as the domestic Space Science Board.

(5) The U.S.-Soviet Space Science Agreement should be renewed.

(6) A detailed proposal for joint long-term research efforts such as lunar and Mars exploration should be prepared and presented by the U.S. to the USSR at the next opportunity.

(7) The U.S. should begin exploring with its space partners the creation of an international remote sensing consortium similar to Intelsat.

(8) International initiatives should be formulated to address global problems such as space debris and global education by satellite.

(9) Efforts to reduce the Militarily Critical Technologies List should continue.

(10) Budget allocations for microgravity research, and especially facilities, should be increased substantially, and such research initiatives should be coordinated more closely among the cognizant NASA departments.

(11) The space station should remain on schedule for deployment in 1994, but its design should be sufficiently flexible to accommodate user demands commensurate with budget, schedule, and operational constraints.

(12) Consideration should be given to making space station deployment and operations compatible with both U.S. and foreign ELVs.

(13) Emergency return should be provided for the space station crews.

(14) International space-station cooperation should be strengthened; competitive pressures should be resolved by more vigorous U.S. research and technology advancement activity.

(15) Young people should be motivated to seek careers in science – and particularly in space – through a number of initiatives detailed in the text.

(16) University education and research in space-related subjects should be upgraded significantly by various methods discussed in the text.

ASSESSMENT

I. INTRODUCTION

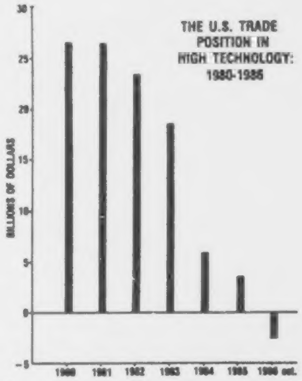
Underlying the theme of this AIAA Assessment is the fundamental premise that a vigorous civil space program is a key element in promoting both national vitality and successful international relations, and that U.S. leadership in space is essential to the strength of the nation.

The leadership role specified by the National Aeronautics and Space Act of 1958 and reaffirmed in President Reagan's July 4, 1982 space policy announcement has brought the U.S. significant economic, scientific, and political returns. Among other achievements, this country led the world in manned space flight and in exploration of the outer planets – Mars, Jupiter, Saturn, and Uranus. We created a global satellite communication system and spearheaded the first true commercial applications of space technology.

In the past decade, however, U.S. space leadership has been seriously eroded by a combination of inadequate domestic emphasis and strong support of foreign space programs by their governments. This situation reached a crisis stage in 1986 with the losses of Challenger and other U.S. launch vehicles. Following the scientific success of the Soviet, European, and Japanese Halley comet armada, the U.S. launch hiatus has offered these nations an unprecedented opportunity to capitalize on the U.S. space program weaknesses that have been building for over a decade in economically important applications (communications and remote sensing) and microgravity research, as well as in space science, technology, and transportation.

The formerly healthy U.S. balance of trade in high technology products and services has been decaying sharply since 1980-81 (see chart) U.S. Trade Position in High Technology 1980-1986, and even the traditionally strong favorable balance in agricultural products declined from nearly 25 billion in 1981 to only 7.5 billion in 1986. Although the aerospace trade balance has remained positive during this period, foreign inroads, particularly in the still-small but rapidly growing space sector, are building alarmingly. Foreign governments provide substantial support of space activities not only in the Soviet Union but also in Europe, Japan, and China, with the clearly stated intent of developing the industrial capability needed to take advantage of growing space-related global market opportunities.

Unless the government strengthens its support of U.S. space activities, particularly in the key areas of space transportation, applications technologies (communications and remote sensing), microgravity research, and advancing the basic science and technology that underlie all new development, the early U.S. lead in this important new economic area will continue to decay.



Source: Report to Joint Economic Committee, U.S. Congress, Oct. 1986

The people of this nation have seen the U.S. lose its competitive position in automobiles, in steel, in electronics, in cameras and other optical products, in clothing manufacture, and now in modern high-technology markets. The tax revenues derived from U.S. industrial capability are needed to sustain essential but non-revenue-generating social programs. Space offers the potential for significant new industrial development, but without strong federal support and investment, the attendant market opportunities will go to the foreign interests who have committed themselves to making that investment.

The AIAA recognizes the urgent need for strong government-industry-university teamwork to return the nation's civil space program to its former preeminence, with the consequent benefits both to economic return and international prestige. Although it may appear to be self serving for an aerospace organization to call for more space-program support, we believe such support to be clearly in the best interest of the nation. Federal deficits cannot be reduced in the long term without revenue growth, and investing in space has high promise for generating the future revenues needed to accomplish that goal.

II. RESTORING MOMENTUM

Access to Space

The first step in restoring U.S. space-program momentum is to regain and ensure regular access to space.

Shuttle Redesign and Requalification. The report of the Challenger commission and NASA's plan for actions to implement its recommendations are responsive to the goal of safely returning the Shuttle to flight status.

Prior to the Challenger accident NASA and Morton Thiokol had discussed a number of potential new designs for the solid-rocket booster (SRB) field-joint that caused the failure, one of which has since been selected for qualification testing. NASA had also received proposals from several contractors to study redesign of the Orbiter's main-engine turbopump assembly, and had already implemented a new landing-gear brake design due to past problems. Since the accident, NASA also initiated a further detailed assessment of all possible failure modes, as was later recommended by the Challenger commission, particularly those with no built-in redundancy. That reassessment, as well as the ongoing reassessment of other potential failure modes, should be conducted as efficiently as possible. Issues involving flight safety must be corrected, including redesign and requalification where necessary; however, overreaction must be avoided, recognizing that manned space flight activities will always include some degree of risk. Attention should be focused primarily on high-probability failure modes identified by analysis and/or test rather than be diffused into every potential failure mode.

In addition to comprehensive qualification of the new SRB field- joint design and improvement of the Orbiter's tire, brake, and nosewheel steering systems, the Challenger commission recommended that "full consideration should be given to conducting static firings of the exact [SRB] flight configuration in a vertical attitude" and to "make all efforts to provide a crew escape system for use during controlled gliding flight." However, although safety should continue to receive the highest priority, it is necessary also to recognize the national importance of providing safe and reliable Shuttle launch capability at the earliest feasible date. Hence the questionable technical benefit of such proposals as full-scale vertical SRB testing, which was eventually deemed unnecessary, and provision for crew escape mechanisms must be assessed in the light of their costs, the delays they could impose on resumption of flight operations, and particularly the implications to safety of increasing system complexity.

Replacing Challenger. The Challenger commission has recommended reducing the Shuttle flight buildup rates originally sought by NASA to ease schedule pressure and insure proper preparation for flight. Nonetheless, a heavy demand will continue to be placed on the Shuttle once it is flying again, including the backlog of Shuttle-unique payloads that will exist well into the 1990s, particularly space-station deployment and operation and manned defense missions. Current estimates of payload demand for Shuttle-unique and Shuttle-compatible launches in the mid-to late 1990s, coupled with realistic projections of orbiter scheduling and downtime (including the probability that at least one orbiter will be temporarily out of service due to unscheduled operational problems), clearly support the near-term requirement for a fourth orbiter, even with maximum use of expendable launch vehicles (ELVs). Hence the President's decision to proceed with the Challenger replacement was clearly justified. However, because the projected demand for Shuttle-unique missions and payload launches is not compatible with the stated replacement schedule (1992) when realistic Shuttle-fleet downtime estimates are considered, procurement should proceed at the fastest possible rate (which, incidentally, would also reduce the total orbiter replacement cost). Further, plans should be made to accommodate subsequent orbiter construction if demand growth warrants it, as recommended by the National Research Council on October 9, 1986. In any case, replacement should be accompanied by procurement of sufficient spare parts and long-lead components to avoid the shortage of such items cited by the Challenger commission in the existing fleet, and should incorporate technology advances which have been made since the existing orbiter fleet was built.

The Congressional decision to appropriate funds for the replacement orbiter over and above the planned NASA budget was essential to avoid decimation of other NASA programs. While commercial financing of subsequent replacements has been discussed at some length, it is not clear that such an arrangement is managerially tenable.

Mixed Fleet. Before 1984 the national policy was to phase out government-funded ELVs and use the Shuttle fleet to fly most government payloads, as well as those of foreign and commercial customers, when the existing inventory of government ELVs was exhausted. In 1985 concerns about the lack of an alternate launcher in the event of a national-security emergency dictated a presidential commitment to build 10 "Complementary ELVs" (CELV; currently designated Titan 4) able to handle large Air Force payloads. Since the Challenger accident and the subsequent Titan and Delta failures, Congress authorized 1.49 billion for Air Force procurement of 13 more Titan 4s and an initial buy of 12 Medium Launch Vehicles (MLVs) for the Global Positioning System (GPS). The Air Force has proposed an additional $2.6 billion beginning in FY 1988 to support its ELV initiatives.

It is now generally recognized that the nation needs to operate a mixed fleet composed of the Shuttle and a family of different ELVs, and that an important integral component of that mixed fleet may very likely be a private-sector ELV launch capability.

In the post-Challenger era, a substantial backlog of all types of payloads is building up. The payloads of commercial and foreign customers represent only a small part of this backlog, but a segment which could provide a business base on which a commercial launch service industry could be established. U.S. commercial launch services able to meet that demand are feasible, and are encouraged by the Commercial Space Launch Act of 1984.

The French corporation Arianespace, partly government-owned, is developing a family of Ariane ELVs able to launch a wide variety of commercial and research satellites from its launch facility near the equator in Kourou, Guiana. Despite failures (four in eighteen launches to date) and a remanifesting of future missions, the convenience and scheduling opportunities offered by Arianespace have filled its launch manifest and created a waiting list for launches through 1989. The Chinese launchers CZ (Long March) 2 and 3, with geostationary-orbit capability for Delta-class payloads, are also available. The Chinese have been marketing aggressively in the West, and secured their first U.S. customer, Western Union, late in the summer of 1986. The current Japanese N-2 and H-I launchers cannot be marketed effectively outside Japan due to internal Japanese agreements that sharply limit their launch window, but Japan is developing the H-2, a Titan-3 class vehicle scheduled to become available in 1992, which may be capable of launch at any time without abrogating those agreements. The Soviet Proton workhorse has been offered for launching Inmarsat satellites (the Soviet Union is a member), but because of limitations imposed by the Soviets and by U.S. technology-transfer regulations no Western payloads have yet been committed to the Proton. That situation, however, appears to be changing, with recent aggressive Soviet moves to market Proton launch vehicles and facilities.

To date, Arianespace has launched or is committed to launch about 40% of the free world's geostationary-orbit satellites; U.S. launchers carried or will carry the other 60%. Arianespace's management has stated that the company's production, qualification, and turnaround capacity through 1991 allows a maximum of 10 launches per year (the current goal is 8), with one or two Delta-class payloads per launch. The Chinese claim they can increase their present CZ-3 flight rate (2 per year) considerably, but it is not likely that they can go beyond 4-6 in the next 3-4 years. Therefore, with Ariane fully booked, with the limited Chinese capacity, with commercial launches on the Shuttle sharply limited by President Reagan's August 15, 1986 policy, with no new U.S. ELVs becoming available until at least 1989, and in view of the growing launch demand backlog, there will be a shortage of launch vehicle capability until at least 1992.

After 1992, however, the picture could change significantly. Besides the effect of as-yet uncertain U.S. launch-vehicle capabilities, major unknowns include the capacity and launch rate of the new Japanese H-2, potential growth by Arianespace in both launch rate and vehicle upgrades, and the more aggressive Soviet marketing posture. But perhaps the most significant unknown is projected launch demand.

Downward variations in demand could occur as a result of satellite technology improvement, which has been steadily extending satellite lifetime and increasing the communications traffic that can be carried; possible delays in introducing new services such as direct broadcasting, teleconferencing, and high resolution TV; and competition in certain markets from optical fiber cables. Upward variations could also occur, however, with the introduction of a whole range of new communication services, the opening of new third-world markets, the development of navigation and position-location services, and other growth factors. The principal element in launch vehicle competition, the global demand for launch services, is therefore not well defined. Projections used in the past to justify major launcher development were grossly overestimated, and current boosters do not offer launch costs low enough to encourage dramatic increases in the number of satellite contractors seeking space transportation.

Loss in launch-vehicle business to foreign operators could also affect sales by U.S. satellite manufacturers in some cases, where foreign launchers may soon be offering "package deals" to satellite operators that include spacecraft, launch, and insurance.

Hence the U.S. must get its launch vehicles back into operation as soon as possible. Although the new business for foreign launchers in the short term will be greater than they can handle, many uncertainties beyond 1992 could leave the U.S. well behind foreign launchers, with the consequent negative impact on balance of trade. Because its present ELVs are technologically a decade or more behind the newest foreign launchers, the U.S. should also provide funding for advanced booster technology and procurement, besides encouraging commercialization of existing booster technology as fast as is economically feasible.

A nascent commercial ELV industry is ready to invest tens of millions of dollars to pursue the commercial and foreign payload market and to establish a private-sector launch capability. It will probably not do so, however, if it anticipates that it will later find itself in competition with its own government, which is also its best customer.

Past government policy, although designed to support commercialization of ELVs, has, in fact, not done so. Past Shuttle pricing policies, whatever their justification, made it unattractive for users to purchase ELV launches, even though many preferred their operational simplicity to the relative complexities of a Shuttle launch. Shuttle pricing policy for commercial and foreign payload launches prior to FY 89 had been set on a less-than-full cost basis on the grounds that the Shuttle is a national resource and that such users should pay only the costs they uniquely impose on the system. The resulting price was lower than the cost of ELV launches. And although the government has been in negotiation with private-sector ELV operators, it has not completed agreements with them regarding hardware transfer and terms of access to launch facilities and ranges.

Further, upper-stage manufacturers and some payload manufacturers who have invested heavily in Shuttle-unique or Shuttle-compatible hardware are now facing the revision of a policy in which the Shuttle was the country's primary launch vehicle to one that embraces a mixed fleet. They had, however, based their business decisions on the old policy, which had been articulated by four administrations and supported by seven Congresses since 1972.

The new policy, established by President Reagan on August 15, 1986, states that the Shuttle will be used as the primary system for the payloads and missions that exploit or need its unique capability, continuing to fly only those commercial and foreign payloads that require a manned presence or the other unique capabilities of the Shuttle or need to be flown for foreign policy reasons. However, any new Shuttle pricing policy for such payloads, reflecting the increased costs associated with reduced flight rate and other consequences of the Challenger commission recommendations, should not deter commercial and foreign customers from flying on ELVs. Such a policy would encourage development of a commercial ELV industry, to ensure that there will always be backup launch capability in the event that the Shuttle or the government ELV fleet is grounded. The present policy should also be amended to allow the Shuttle to be available as a backup if no acceptable U.S. ELV alternatives are available, as well as when its unique capabilities are needed, and to protect against the grounding of one or more elements of the ELV fleet. Although this policy is certainly appropriate for the immediate crisis situation, it should be reexamined when the present Shuttle backlog has been reduced to make sure that users are being properly served, and that the costs of launching payloads on U.S. vehicles are competitive with those of foreign launchers.

The issue at hand is what government policies are necessary to restore a robust overall national launch capability that does not rely totally on any one launch system, and at the same time encourage a private-sector ELV industry without compromising that capability or negating the substantial investments already made in Shuttle-dependent systems. Such policies involve two factors: provision of launch services for commercial and foreign customers, and procurement of ELVs for government requirements. Government procurement and use of expendable launch vehicles to meet government requirements should be carried out so as to encourage and facilitate the development of commercial launch services, in consonance with a national space launch plan. This appears to be the case with the current Air Force MLV procurement, and is consistent with general government policy to avoid competition with commercial endeavors.

The critical dependence on still-uncertain government policy decisions is one of the fundamental problems facing all sectors of the nascent commercial space industry. Another is the unwillingness on the part of some customers, and particularly some potential government-agency users, to rely for so important a function as space launch on new and often untried organizations, because of both the possibility of business failure and their lack of experience and expertise in assuring reliability. Hence many commercial payload manufacturers and operators believe that the most rapid and politically feasible way to make a mixed fleet available to users would be to return to NASA the control of all non-DOD launches – aggregating the market, procuring ELVs, and providing launch services in a user-oriented policy framework – although some feel that without adequate budget resources and a clearly defined policy to follow, NASA is unlikely to be fully responsive to the requirements of commercial users.

Accompanying any government procurement policy should be a plan to deal with issues of timing, special circumstances, and the role of government in providing support (other than subsidy) for the transition of commercial and foreign users from the Shuttle to commercial ELVs.

Credibility and Morale

Credibility. As a result of the Challenger accident and particularly the findings of the Challenger commission, NASA's former high credibility as an able organization has deteriorated seriously. Before January 1986, public expectations of performance were perhaps too great. Space launchers can never be 100% reliable, and the public and the Congress have tended to underestimate the true potential danger of space flight. The professional space community, therefore, must act decisively and rapidly to improve public understanding of the

RESULTS OF MARKET OPINION RESEARCH POLL AUG 1-9, 1986
(JAN 3-8, 1986 SURVEY IN PARENTHESES)

QUESTION	AGREE (%)	DISAGREE (%)
Do you approve of the space program?	70 (63)	20 (21)
Should the space program be continued?	70 (65)	16 (21)
Should it be expanded?	57 (46)	30 (35)
Should space expenditure be cut?	34 (35)	52 (46)
Should we resume manned flights, with risks?	89	10
Should we build a new Shuttle and press on?	85	13
Should we fly both astronauts *and* key civilians?	76	22
Should we build a new permanently manned space stations?	60 (58)	15 (25)
It is important to stay ahead of USSR and Japan?	71 (68)	20 (21)
Should we spend whatever is needed to maintain space leadership?	60	27
Should we increase NASA budgets from 0.7% to 1% of the federal budget?	59	23
Should we encourage a private industry in space services?	80	14

Source: "Public Opinion Survey on Attitudes Toward Space," Market Opinion Research, August 1986.

real risks and benefits of space, as a key element in counteracting the doubts cast on NASA's ability to carry out its programs efficiently and safely. Despite the agency's excellent past record of achievements in space science, applications, space transportation development, and the creation of new technologies, it is an unfortunate but real fact of life that an organization's ability is judged mainly on the basis of its most recent undertaking, not on how well it performed in the past.

Further, although U.S. public support for the space program, and manned flight in particular, is as strong as ever (see chart), space is not a pressing topic to the majority of U.S. citizens. NASA and the aerospace community have not been totally effective in communicating space benefits or accomplishments to the public, nor in stimulating sufficient interest among professional communicators for them to undertake that task to any appreciable degree.

Besides clarifying the real risks of space flight, therefore, the space community should undertake to reinvigorate public information and public relations programs. We should explore new and proven mechanisms to stimulate media and public interest as well as understanding. An active rather than a reactive policy is in order. The past accomplishments of NASA have not been stressed enough, nor have the many benefits of space activity such as "Earthwatch" (predicting climate and weather disturbances and anomalies) and transfer of useful space technologies to the public sector. A comprehensive communications program should be established that highlights issues appealing to a wide audience, demonstrating how an active U.S. program in space benefits the individual. Media and public understanding of space issues may be improved by promoting information resource services such as an aerospace expert group willing to respond to emergency requests by the news media for answers and explanations and by creating innovative ways for the general public to participate, even if only indirectly, in the space program. One example of such a program is the annual U.S. Space Observance Activities Week (July 16-24).

Professional technical societies such as AIAA, ASME, AAS, and IEEE can play an important role here by working together. If a consensus could be obtained on major issues confronting NASA and the space community, the united efforts of the societies could be extremely effective in disseminating the views expressed in this paper to decision-makers, opinion leaders, and news media. The societies could also form a council to award each year a distinguished international prize for contributions to the peaceful use of space, and should seek a benefactor to endow such a prize at a level comparable to that of the Nobel prizes.

NASA, of course, also has an important role in restoring momentum to the U.S. civil space program. The Challenger commission expressed serious concerns regarding questionable management and decisionmaking practices. Although many of the associated problems are a direct result of constrained budgets, which led to curtailment of the development procedures needed to assure success, NASA was a party to this process (although vigorously opposing inappropriate budget cuts), and thereby created not only a public misconception of low space transportation risk, but also contributed to the factors that led eventually to Challenger's failure. It is therefore essential that NASA focus on achievable operational scenarios and developments to implement its goals within projected costs, as well as acting expeditiously to correct the management problems identified by the Challenger commission.

Morale. NASA and the space community must also act vigorously to revive the high morale essential to a successful space effort.

Much of the basis for personnel morale is a strong identification with an important cause. The self-esteem of NASA's employees was closely tied to the agency's excellent reputation and epic accomplishments. In particular, the Apollo program was an incomparable prestige centerpiece, but there has been no such focus since. Neither the Shuttle nor the space station are ends in themselves.

The natural consequence of the post-Challenger criticism that the agency has undergone (both within the government and in the news media) is a loss of morale and confidence among many NASA personnel and with it some related industry-wide reaction. Although to some degree this can be turned to advantage in striving to overcome the consequences of the Challenger disaster, many skilled people, especially those who were not part of the NASA "glory days" during the Apollo program, nevertheless may tend to look elsewhere to further their careers.

This condition exacerbates a NASA personnel concern that existed prior to the accident. Many senior managers and engineers have been with NASA since the Apollo era or earlier. Hence these senior people are near retirement age and there has not yet been enough time to train the small but excellent group of young people who have joined the agency only recently. Budget cuts deriving from the Deficit Reduction Act could increase the rate of early retirements, and the new Tax Reform Act, which begins to tax at retirement those who retire after its enactment, has already stimulated such an increase.

Further, many of NASA's brightest young engineers are conducting exciting research in some of the field centers, and are not yet ready to relocate to more management-oriented functions until later in their careers.

The result of these trends is a net loss in experienced management personnel and senior engineering leadership, which could jeopardize the rapid return to efficient operational normalcy that NASA needs to restore its credibility and thereby its internal morale.

Every effort should be made to interest both young engineers and senior management people in industry to seek suitable opportunities at NASA, the latter, perhaps, on a two-year loan basis until the present crisis can be bridged. As pointed out earlier, the space community should also use whatever means are at its disposal to recreate recognition of the space program's – and especially NASA's – strengths, accomplishments, and abilities among the press, the public, other government entities, and the non-space industry, taking care, however, to avoid overenthusiastic salesmanship. The professional leadership must seek ways to reestablish the esprit of space, which had begun to dissolve to some extent even before the Challenger accident, and to motivate more strongly the long-range planning that characterized the early years of the space program.

One prospect would be to meet the challenge of a bold dramatic mission such as a manned flight to Mars or establishment of a lunar base. Every NASA employee must be made to feel part of something important, and that his or her personal contribution is vital to the NASA team effort.

But by far the most important factor in restoring morale would be a series of successful Shuttle and ELV flights. Hence the corrective actions cited in this paper deserve maximum emphasis.

III. MAINTAINING SPACE LEADERSHIP

As highlighted by the current space crisis, the nation's leadership must come to grips with the fundamental incompatibility between the need for U.S. preeminence in space and the present contraints on NASA and other civil space budgets. NASA cannot hope to achieve the goals delineated in the 1958 National Aeronautics and Space Act and subsequent legislation with its current and projected budget levels. The nation has a clear choice - provide the necessary funding or redefine our goals.

A Balanced Civil Space Program

NASA's primary space-related functions are to conduct programs in space science, space exploration, advancement of space technology, space applications, and development of the infrastructure needed to carry out the nation's space program. U.S. policy recognizes that leadership in these areas Is essential to national vitality and.foreign relations. However, the AIAA has often expressed its concern about the balance between the resources devoted to space science, exploration, technology advancement, and applications on the one hand, and infrastructure development on the other.

There is a belief in the scientific community that the ordered plan for continuing space science progress has been derailed because of the emphasis on manned space development during the last 15 years, namely the Shuttle and the space station, although space science has continued to receive a constant fraction of the NASA budget. An additional factor is the vastly increased cost of many space science projects, a result in part from advances in technology, which allow more to be done, and advances in science, which require that more is done, often with better (usually bigger and more expensive) equipment.

In recognition of the need for defining and maintaining a vigorous role for science in NASA, the science communities over the years have developed long-range strategies such as the Solar System Exploration Committee's (SSEC's) report, "Planetary Exploration Through the Year 2000," the Astronomy Survey Committee's "Astronomy and Astrophysics for the 1980s" (the Field report), and several reports by the Space and Earth Science Advisory Committee (SESAC). The first two steps in the SSEC's report, the Venus Radar Mapper and the Mars Observer, have already been initiated (although budget pressures threaten to delay the latter), as have been the first two major recommendations of the Field Report, the Hubble Space Telescope and the Gamma Ray Observatory. But the SSEC's next mission, the Comet Rendezvous flight, did not receive its expected new-start commitment in FY 87 (although there was an important new science start, Topex), nor did the Field report's proposed Advanced X-Ray Astrophysics Facility (AXAF). With the present budget situation, it will become more and more difficult to obtain such new starts in future years.

It is essential that we continue to implement these long-term plans. This requires both multi-year budgeting and substantial growth, by the order of 100%, in space science budgets if the U.S. is to maintain its vitality in these key areas. A particular problem is the present (and future) constraint on science missions due to the limited availability of launch systems. Adequate funding for launchers is a major element of e recommended budget increase.

Those in the observational sciences (astronomy, planetary sciences, astrophysics, solar-terrestrial physics, etc.) have been the most visible public spokesmen extolling the benefits of the use of space for scientific advancement. With few exceptions (such as the man-tended Space Telescope), these types of missions are unquestionably more effectively and less expensively conducted with robot spacecraft than with manned systems, which require complex safety and life-support systems. On the other hand, science experiments which utilize the space environment (materials processing, life science, bioastronautics, etc.) in general benefit by the presence of people and can contribute substantially to the manned exploration of space. We also cannot underestimate the visibility and long-term importance of manned activities to the national spirit and security, not only in accomplishing technical objectives, but also in generating public interest, pride, and support. All space activities benefit from the existence of manned programs, as was most obvious during the Apollo program.

To carry out NASA's functions most effectively, therefore, a balanced mix of unmanned, manned, and interactive (people plus automated and robotic) systems should be used, depending on the task to be performed. NASA should not impose any artificial rules, but should determine the criteria for, and use, the most efficient and cost-effective mode for each function. For example, planetary exploration, remote-sensing operations, and operational satellite communications, at least for the near future, are functions that are best performed by unmanned spacecraft. Materials processing, life science research, and space infrastructure development benefit substantially from the efficient decision-making and responsive action abilities provided by humans. Automation and robotics technology should be incorporated to the fullest practical extent to reduce demand on the crew and to lay the foundations for future space exploration.

In space applications, NASA has an excellent record of developing infant technologies into competent, valuable contributions to mankind. The two main instances of such development are satellite communications and Earth remote sensing.

The first "communications satellite" was Sputnik I; in beeping its way around the Earth it transmitted a most important message: "I am here". One of NASA's first tasks was to raise the technological level of the primitive early satellites. By 1962, when the Communications Satellite Act was written, it was already clear that satellite communications could be a major industry, and NASA continued a sound program in technology development to support that industry for another decade.

In 1973, however, the administration decided that the by then healthy satellite communications industry could continue the technology development process on its own, and that federal technology support was no longer needed. Unfortunately, though, virtually all industry research and technology was aimed at short-term goals to improve revenues and cut costs. Technologies directed toward major long-term improvements were not pursued in the U.S., but were actively developed by European and Japanese companies with substantial support by their governments.

In just a few years it became clear that a federal role in advancing technology was critically needed, as sophisticated European and Japanese systems began to emerge. The AIAA stated that need in a 1976 position paper, "The Federal Role in Communications Satellite R&D", and in 1983 NASA proposed a new technology initiative, the Advanced Communication Technology Satellite (ACTS) demonstration program to conceive, develop, and verify high-frequency technologies in antennas, switching, baseband processing, amplifiers, and other areas.

But almost since its inception, the ACTS program has suffered from inconsistent federal budget policies. It was deleted by the administration from the FY 85, FY 86, & FY 87 budgets, and reinstated each year by Congress. ACTS is essential to maintain U.S. competitiveness with superior technologies already being integrated into foreign satellites, and should be vigorously supported.

The situation in remote sensing is perhaps even more serious, despite the remarkably successful development and use of the meteorological satellites that delivered the first benefits of space technology to mankind. The global cooperative system operated by the World Meteorological Organization is now indispensable to people worldwide.

But in land remote sensing, NASA may have been *too* successful. The Earth Resources Technology Satellite program, later renamed Landsat, was designed to demonstrate the value of remote sensing of the Earth from orbit. In doing so, NASA developed a quasi-operational system that offered its images to users worldwide at subsidized prices well below actual cost. Although a healthy value-added industry developed to process these images for specific users' needs, when it came time to transfer Landsat to the private sector, as had been done so successfully in satellite communications, there was little incentive for companies to do so without federal subsidization.

Nevertheless, after years of federal policy vacillation, one company, Eosat (a joint venture by RCA and Hughes), finally signed an agreement with the National Oceanic & Atmospheric Administration to take over and operate the Landsat system, including the building and launching of additional satellites, based on a specified schedule of federal subsidy payments. To date, however, despite strong Congressional pressure, the administration has not honored its agreement, and competition by the French SPOT system (along with potential future competition by Japanese, Canadian, and European systems under development) threatens what had been a wholly U.S.-dominated market for well over a decade. It is therefore essential that the government honor its commitment to commercialize the land-remote sensing system.

Both these instances derived in part from a fundamental problem with the U.S. civil space program: the deterioration of NASA's space technology development programs as a result of constrained budgets since the late 1960s. In August 1986 NASA's Advisory Council issued an unprecedented public statement criticizing the administration for allowing its past investments in space technology to be consumed without adequate renewal, noting that the untempered public expectation of U.S. preeminence in space has not been backed up by the requisite resources.

In recognition of this now-chronic problem, NASA has formulated a Civil Space Technology Initiative aimed specifically at remedying gaps in the nation's space technology base and developing technologies applicable to specific key systems. Technology base areas requiring urgent attention are aerothermodynamics; energy conversion; propulsion; materials and structures; data, communications, and information sciences in general; guidance and control; human factors; various space flight technologies; and systems analysis. Specific system applications for these technologies include Earth-to-orbit, and orbit-to-orbit propulsion; aeroassisted maneuvering; sensors and high-data-rate information systems; large structures (both flexible and segmented); spacecraft electric power; and robot and autonomous systems.

The National Commission on Space has recommended that budget commitments to space technology advancement be increased by a factor of three. Recognizing that this small but extremely important area consumes less than 2% of the present FY 87 NASA budget, the AIAA strongly supports this recommendation as being essential to all areas of space development.

Budget Policy

Beginning with the post-Apollo curtailment of NASA's future plans (which had included a space station and Shuttle, a lunar base, and a manned Mars mission), civil space budgets have limited the options that NASA could pursue. Many of the factors that eventually led to the Challenger accident are traceable to the severely constrained budget allocated to so complex an engineering project. The need to complete Shuttle development under the constrained budget also led to the much-criticized contraction of major space science and applications projects and such intrinsically valuable activities as space and aeronautical research and technology and materials processing research, as outlined above. This budget policy created a steady trend toward making the U.S. a second-class space nation. The current NASA budget is less than half (in constant dollars) of what it was in the Apollo era, whereas most other federal-agency budgets have increased significantly (see chart). This year's constant-dollar budget for housing and urban development, for example, is nearly 20 times higher than it was in the mid-1960s. Although obviously necessary, such costs often do not represent investment for future national growth, as space program budgets do.

Such policies are not consistent with the concept of preeminence. It is necessary to commit the nation to a coherent national space plan, perhaps (although not necessarily) of the type proposed by the National Commission on Space, along with the funding needed to implement both the plan's goals and the infrastructure to support them. If that plan presupposes U.S. preeminence in space, as the AIAA strongly believes it must if the U.S. is to remain a political and economic power, the civil space budget must be increased as quickly as practical to about 40% greater than the FY 87 level, and then grow at a rate at least equal to that of some measure of the economy; for example, the gross national product.

This action requires a major political commitment by the administration and full support by the Congress, because the additional funding is required during a period when all federal budgets are under severe deficit reduction pressure, particularly the budgets for discretionary expenditures such as NASA's (in contrast to relatively fixed entitlement expenditures).

It is particularly important that those responsible for government budget policy distinguish between investment funding, which creates future capabilities, and non-investment or sustenance funding. In recent years the U.S. has experienced difficulty in competing internationally in traditional manufacturing sectors with foreign producers who enjoy low labor and other costs. Hence the U.S. must seek to compete in higher technology areas. Many other governments recognize this and do provide support for high-technology development as a matter of government policy.

Space is a prime example of high-technology development. The U.S. government should therefore recognize civil space expenditures as an investment in the future industrial competitiveness of the country, and increase them appropriately as recommended above. Particular emphasis should be given to those areas where U.S. preeminence is essential to the national interest.

Further, most major space projects require long-term commitments, generally of the order of a decade or more. Such commitments are not compatible with annual budget authorization and appropriation processes. For example, cancellation of the U.S. commitment to a twin spacecraft for the multi-year solar polar Ulysses mission after Europe had implemented its commitment created mistrust on the part of the European Space Agency, which is reflected in current space-station negotiations with the U.S. Hence we strongly recommend that NASA be authorized to make multi-year budgetary commitments (as have been approved for major DOD projects).

IV. ORGANIZING AND MANAGING THE CIVIL SPACE PROGRAM

Formulating Space Policy

When NASA was created in 1958, the need for a top-level policymaking body was recognized by establishing the National Aeronautics and Space Council, chaired after 1961 by the Vice President. The Council was later abolished, and its space functions are now carried out by the Senior Interagency Group - Space (SIG-Space). The Commercial Space Transportation Act of 1984 established an Office of Commercial Space Transportation in the Department of Transportation to imple-

COMPARISON OF FEDERAL AGENCY OUTLAYS

(BILLIONS OF 1985 DOLLARS)

Agency	1965	1970	1975	1980	1985	% Growth (85-65)
Agriculture	21.7	21.6	29.5	45.9	55.5	+ 156%
Commerce	1.3	2.0	2.0	4.1	2.1	+ 66
Defense	152.9	206.1	163.1	172.9	245.4	+ 60
Education	3.7	12.1	14.3	19.5	16.7	+ 354
Energy	8.0	6.1	6.1	8.5	10.6	+ 32
Health & Human Services	69.1	75.7	197.9	256.4	315.5	+ 356
Housing & Urban Development	1.5	6.2	14.3	16.8	28.7	+ 1771
Transportation	17.4	17.3	19.1	26.1	25.0	+ 44
Environmental Protection Agency	.4	1.0	4.8	7.4	4.5	+ 974
NASA	15.9	9.6	6.2	6.5	7.2	− 54
Total U.S. Government	368.9	502.8	631.4	780.0	946.3	+ 157

SOURCES: Office of Management and Budget (FY 87) and Congressional Budget Office.

ment the commercialization of ELVs, and the President has created an Interagency Commercial Space Working Group within the Economic Policy Council to implement other space commercialization thrusts. International interactions in the space field involve NASA, the Department of Commerce, and the Department of State, but their interaction has not been formalized other than indirectly through SIG-Space and the National Security Council.

NASA and the Air Force have worked together successfully for years on projects of mutual interest. Because there is a significant degree of military-civil commonality in launch vehicles, launch facilities, spacecraft, communications, and sensor technology, this long-standing policy for cooperation in sharing technology development, facilities, and launch-vehicle development and use should be encouraged to maximize their utilization and avoid duplication.

NASA's main avenue for participation in administration policy is SIG-Space. However, because SIG-Space is composed of individuals who represent the specific parochial interests of their own agencies (Depts of State, Treasury, Defense, Justice, Commerce, and Transportation, as well as OMB, CIA, the Joint Chiefs, the Office of Science & Technology Policy, and NASA), there is no unified motivation to create policies which benefit the nation as a whole. This was most clearly evident in the many months of indecision following the Challenger accident. Therefore a separate dedicated body should be created at a high level in the administration to replace the coordination and policy functions now conducted by SIG-Space. Several of the potential mechanisms for accomplishing this which have been suggested, such as reestablishing the National Aeronautics and Space Council or creating a cabinet-level space agency, would be suitable, but the primary purpose of this action should be to avoid the present parochialism and to provide direct and timely access to the President. Among the tasks facing the new body are developing and implementing a comprehensive long-term civilian space program, coordinating all national and international space activities, and resolving key policy issues such as a coordinated U.S. approach to launch vehicles.

Transportation System Management

The events of 1986 underscored a number of long-standing problems with NASA's space transportation system management. Specific concerns identified by the Challenger commission included decentralization of management authority within the agency, the lack of former astronauts in management positions, inadequate safety review authority, inadequate communications on Shuttle operational problems, and an inadequate quality assurance management structure.

Since the accident, the NASA Administrator presented to the President a report on the actions taken to implement the Commission's recommendations. Specific actions related to space transportation management include an assessment of overall NASA program management, assessment of the Space Shuttle management structure (including the relationship between the program office and the field centers), and establishment of a Shuttle Safety Panel with direct access to the Space Shuttle Program Manager.

Several astronauts have been appointed to key management roles, including that of Associate Administrator for the Office of Space Flight. Among the actions urgently required of that office are creation of a plan for space transportation system operations and future development that reflects the occurrences of 1986, in cooperation with the Defense Department and the overall space policy body (see above). Subsequently the Associate Administrator needs to develop plans to ensure commercial ELV launch-related quality assurance and safety (in cooperation with the Defense Department), for space station transportation during development, deployment, and operations, and ultimately for transition of space transportation operations to a dedicated operations entity when warranted.

Although the nation will no longer rely solely on the Space Shuttle as its primary space transportation system, it nevertheless will represent a key element in the U.S. space transportation fleet for at least the next ten years and possibly longer. But even prior to the Challenger accident, NASA had begun to experience problems in meeting its prescribed launch schedule. These problems included inadequate training time for flight crews, excessive overtime work by Shuttle processing personnel, lack of adequate spare parts, abridgement of critical component maintenance procedures, difficulties with orbiter landings at the Kennedy Space Center, higher replacement rates of critical components than were planned and budgeted (e.g., main-engine turbopump elements), etc. Since the accident questions were raised as to the adequacy of flight readiness reviews, the decision-making process involved in imposing and removing launch constraints, and the overall internal communications process related to launch decisions prior to and during the countdown.

To correct these problems, the Challenger commission recommended a reduced flight rate to decrease the schedule pressure; using Edwards as an alternative to Kennedy for landing whenever weather is unpredictable; and improving the processes for defining launch constraints, conducting flight readiness reviews, improving maintenance procedures, and opening internal communications channels.

NASA should also assess the value of significant investments to reduce Shuttle operations and maintenance costs and increase system availability by adequate logistics support and by product improvements associated with engine and orbiter refurbishment such as turbomachinery life, engine performance level and reliability, logistics, and thermal protection. A backup Shuttle carrier aircraft should be provided, in part to support the additional landings at Edwards.

Because of factors such as the limitations of a three-orbiter fleet, the Air Force has decided to put the Shuttle launch complex at Vandenberg on a caretaker status until 1992, and have the military use instead a combination of expendable vehicles out of Vandenberg and Kennedy and Shuttles out of Kennedy. If there continues to be a projected requirement for polar manned missions (e.g., servicing of polar-orbit space-stations or other platforms), the nation will need to bring the Vandenberg Shuttle launch complex to operational status in time to prepare it for such activities.

Safety and Quality Assurance

The Challenger commission recommended that NASA establish an Office of Safety, Reliability, and Quality Assurance headed by an Associate Administrator reporting directly to the NASA Administrator, to be responsible for "The safety, reliability, and quality assurance functions as they relate to all NASA activities and programs" The NASA Administrator has since appointed such an Associate Administrator.

However, simply adding more inspectors and procedures may, in fact, introduce delays, higher costs, and divided responsibilities. It is necessary that the new Associate Administrator fully recognize the need to motivate quality- assurance personnel (and, indeed, all who work on the nation's space program) to restore their dedication to performance and the pursuit of excellence, and to upgrade methods, equipment, training, and incentives to attract the best new people.

It is also important to recognize the vital role *technical* management plays in quality assurance, both through the creation of "forgiving" designs and proper qualification testing in the first place, and through careful and independent technical reviews during all phases of design, development, test, and operations.

Insurance

The insurance losses incurred in recent years (since the mid-1970s) by launch and in-orbit failures have amounted to almost $900 million, less than $500 million of which was covered by premium payments. Although the 1986 launches of Challenger, Titan, and Delta did not carry insurable payloads, their failures compounded the insurance dilemma. As a consequence, the insurance pool available for a single flight has shrunk to about $90 million, less than the cost of a typical single satellite and its launch, and far less than the insurance required for multiple payload launches. Further, underwriters will not write a policy more than 90 days prior to launch, to keep rates current. The result is that lending institutions will not issue loans to satellite owners or operators without insurance as a factor in repayment in the event of a launch failure. Consequently, only large corporations or governments that have the resources to sustain large losses can afford to buy and operate satellites. However, large corporations that can obtain financing are reluctant to make investments without insurance coverage, because launch failure would be catastrophic to the corporation. Both Arianespace and the Chinese provide insurance to their customers, if necessary, with government backing and support.

The Departments of Commerce and Transportation should encourage rejuvenation of the launch and spacecraft insurance industry, and the Department of Transportation should set reasonable limits on third-party liability for commercial ELV operators. The insurance industry, in concert with spacecraft manufacturers, spacecraft operators, and launch vehicle operators, should design its own structure for recovery to bridge the present capacity and structural shortfall. However, the government should consider the prospect, on an emergency basis until acceptable launch and satellite failure rates have been reestablished, for servicing as insurer of last resort; that is, if a spacecraft operator is unable to secure sufficient launch and liability insurance in the commercial marketplace, the government, in cooperation with other governments where appropriate, would provide insurance during a defined transition period, but at a premium rate considerably above that available in the open market.

V. BUILDING FOR THE FUTURE

Although regaining civil space program momentum certainly ranks highest in immediate priority, failure to plan properly for the future could bring the U.S. once again into a situation comparable to that which now exists. Hence it is necessary to begin *now* the planning process to resolve both near-term and far-term civil space program issues. Some of the key areas which require urgent attention are addressed here.

Space Transportation

Launch Operations. Contrary to early expectations, the Shuttle must still be considered as a developmental program, has yet to achieve mature operational status, and therefore must continue to be operated by NASA. During this time it can be viewed as a national facility, much like a NASA wind tunnel, for use in furthering the space interests of the nation.

In 1985 the National Academy of Public Administration was asked to examine the feasibility of a government corporation within NASA to conduct Shuttle operations. The study concluded that it was feasible but not warranted. Shuttle operations management has been studied extensively in the past 15 years, and most studies have concluded that Shuttle operations are still best done by NASA.

However, the continued addition of long-lived facilities to NASA's cognizance, whether for infrastructure or for science, captures more and more of the budget and limits new initiatives. Therefore, at such time as the Shuttle becomes operationally mature, consideration should be given to transferring its operations to a separate organization dedicated to that function.A concept proposed at AIAA's June 25-26 ELV workshop, for example, and subsequently by the Congressional Budget Office in October 1986, would place *all* U.S. space launch activities in the hands of a national space transportation company similar to Arianespace, whose owner would be the U.S. government and private-sector manufacturers, operators, and users of space launch systems. However, such a concept, which requires legislation comparable to the Communication Satellite Act of 1962, would take at least several years to implement. Should unforeseen difficulties arise in formulating a viable quasi-government corporation of this type, Shuttle operations (and, indeed, perhaps all operational aspects of the civil space program) could be turned over to a federal agency, perhaps NASA, but such operations must be specifically organized for that purpose and clearly separated from NASA's basic R&D function.

Upper Stages. The original plan for the U.S. space transportation system included a high-performance reusable "space tug" called the Orbit Transfer Vehicle (OTV) for access to orbits beyond the Shuttle's. Budget constraints delayed this approach, and the DOD agreed to develop an interim system. The Air Force funded the development of the "Interim Upper Stage (IUS)". Its capability was then expanded to meet longer-range reqirements, whereupon it became the "Inertial Upper Stage." Meanwhile, NASA encouraged several private-sector developments of expendable orbit transfer stages. Some integral orbit transfer propulsion systems for spacecraft have also been developed.

Modifications to the IUS had been planned to deliver Galileo and Ulysses missions, and these developments proceeded through preliminary design. In 1982 NASA decided to develop a Shuttle Centaur to perform these missions. Two versions of the high-performance Centaur were planned.

In June, 1986, NASA elected to cancel use of Centaur in the Shuttle, primarily due to safety considerations. NASA is developing alternative scenarios to meet the planetary requirements in the near future.

Agreement is required as soon as possible on the configurations of existing launch vehicles and upper stages, incorporating modifications as required, to fill the high-performance gap left by the Centaur cancellation. In the long term, NASA and the DOD should initiate the development of a reusable high-energy stage for the Space Shuttle, and ultimately as an element of the space station. This development could be undertaken in phases; that is, qualify the stage first as expendable, then as reusable, and perhaps eventually as man-rated. Technology demonstrations such as an OTV aerobrake experiment should be implemented to improve that technology base for development of future systems.

New Launcher Development. It has long been recognized that the extensive space operations projected for the future, both civil and military, will require increases in payload weight and, especially, significant reductions in the cost of placing payloads in low Earth orbit and beyond. Development of such next-generation launch systems is one of the principal recommendations of the National Commission on Space. The National Space Transportation and Support Study conducted by DOD and NASA to define the next-generation national space transportation system needs, based on a broad range of mission requirement scenarios, has already concluded that a new unmanned launcher, a new manned launcher, a reusable orbit transfer vehicle, and new approaches to operations will be needed. The study examined various alternatives for new launcher development, including conventional multistage expendable rockets, two-stage and single-stage-to-orbit reusable designs, and aerospaceplane concepts, but did not select a specific approach because the U.S. has not yet established a sufficient technological base to allow a choice between advanced-technology design alternatives. The U.S. has also initiated a multiyear aerospaceplane research effort, with flight testing of a research aircraft planned to begin early in the 1990s.

Significant international launcher capability is available or is being developed. Japan, China, the Soviet Union, and ESA/Arianespace partners are all proceeding with advanced launch system developments. Aggressive U.S. action is required to counter these developments to maintain a healthy U.S. competitive position in the future commercial launch services market, as was pointed out earlier.

The decisions needed to pursue next-generation space transportation developments must be based on an integrated long-term national launch plan that best accommodates the disparate launch transportation needs of both the government and the commercial user communities. It is essential that long-term development decisions on the next-generation launchers be made independently of the present launch crisis and the constraints resulting from short-term budget deficit considerations.

NASA and other agencies involved in space activities should work collectively to build on the results of the current space transportation architecture study in defining the launch capabilities needed to re-establish and maintain U.S. leadership in space. The administration should then proceed as rapidly as possible with technology developments necessary to select and define preferred configurations for next-generation launch systems, with attention given to ensuring backup in the event one system is grounded.

Expenditures for advanced space transportation system technology have been constrained to a very low level for over 15 years by a combination of high expenditures for Shuttle development and deployment and relatively flat NASA budgets. Recent failures of the Shuttle, Titan, and Delta will increase near-term investment to develop fixes and replace Challenger. A broad-based technology resource exists, is posed for major advances, and could be applied to accelerate space transportation system development. Emerging new technologies offer prospects for major improvements in performance, cost, automated operations, and reliability, but are not being vigorously pursued because of lack of funding and trained, experienced personnel.

Advances in space transportation system technologies in areas such as chemical propulsion, materials, structures, and unconventional concepts will be required for selection of and application to the generation of expendable and reusable launch vehicles in the mid-1990s and beyond. It is essential that NASA reinstate its fundamental research and technology advancement programs in these areas, including but not limited to those associated with the aerospaceplane, directed toward maintaining a U.S. competitive launch-vehicle edge in the 21st century. It is also essential that DOD continue technology advancement programs in its areas of interest.

In pursuing the selection and definition of next-generation launch options, mission requirements based on the needs of both civil and DOD programs, including the demand which may evolve as a result of the Strategic Defense Initiative (SDI) effort, should be used to size and otherwise define these launch systems.

International Involvement

U.S. activities in space put it in competition with other countries, but many space activities benefit from international cooperation. Further, space cooperation and competition can enhance U.S. foreign policy. In the future, the U.S. will continue to be involved in both cooperation and competition.

NASA has carried out over a thousand space agreements with more than a hundred countries for various cooperative activities in space. Such agreements have worked to advance U.S. interests in many ways.

Cooperation in space activities can save money through cost sharing, can open new markets and avoid confrontation and cut-throat competition in certain fields, and is the logical procedure when dealing with such problems as weather and environmental pollution, which extend beyond our borders. Other opportunities for cooperation, discussed in greater detail later, include control of space debris, Earth observation, space science, the space station, Mars exploration, and cooperative utilization of launch systems.

Various factors limit the extent of international cooperation; for example, national security, national prestige, technology transfer, regional or political blocs, restrictions attached to funding commitments, and economic/competitive advantages. However, the benefits of international cooperation in terms of cost sharing, improvement of both trade and political relations, and widening of commercial markets is today more important than ever before.

Science. Starting with the International Geophysical Year (IGY) in the late 1950s, international cooperation in scientific missions has continually increased and represents an area where many parochial boundaries have been crossed successfully. Exchanges of data and international response to instrument Announcements of Opportunity have been prevalent. A Soviet/US Space Science Agreement, which expired in 1982, was also fruitful. On the negative side, U.S. withdrawal from programs that it initiated, such as Ulysses (then the International Solar Polar Mission), have introduced a cautionary note in ESA's subsequent participation. To date, foreign participation in our planetary programs has been minimal, permitting undiluted U.S. prestige gains. Thus, it appears that some improvement in our scientific relationships with foreign organizations could be made. For example, we should promote more vigorously our scientists' participation in foreign programs. Many present mechanisms exist for doing so, both governmental and nongovernmental, but it may be useful to establish an International Space Science Board similar to our indigenous one. A necessary ingredient for improved cooperation requires that some mechanism be created for committing budgets over several years so we would not be forced to renege on our promises.

The U.S.-USSR Space Science Agreement should be renewed. To reinvigorate the process of U.S.-USSR collaboration in space science, there is an obvious opportunity to coordinate the forthcoming 1989 Soviet mission to Phobos with the subsequent U.S. Mars Observer flight. A follow-on opportunity could be a cooperative Mars sample return mission.

Another excellent opportunity for near-term cooperation with the USSR is the International Solar-Terrestrial Physics program (ISTP). ISTP is currently a US/ESA/Japanese program in which each participant provides at least one spacecraft with the overall objective of making detailed measurements of the Sun, the solar wind, the magnetosphere, and the ionosphere. The USSR could contribute one or more spacecraft to ISTP, perhaps their concurrent INTERBALL program. Other possible near-term U.S./Soviet cooperative activities would involve manned missions; for example, exchange of crews between the Shuttle and the Soviet's Mir space station, demonstration of rescue of cosmonauts or astronauts, installation of U.S. experiments on Mir and Soviet experiments on the Shuttle or space station, and the carrying out of joint experiments in the life sciences that could bear on tests critical to a future manned Mars mission.

The groundwork should be laid now for a U.S. proposal incorporating these elements, perhaps leading to longer-term programs such as a cooperative manned flight to Mars, a scientific outpost on the Moon, or extending the search for extraterrestrial intelligence. Such a proposal should be offered at the next opportunity.

Earth Observations. The observation of the Earth's atmosphere, oceans, and land has been conducted from space for more than 25 years. That experience has demonstrated incontrovertibly the utility of these measurements, and essentially all the nations of the world employ space-derived data on a daily basis. Further, the technology upon which the measurements are based now exists in a large number of countries. Thus, the desire to obtain data, the capability to exploit them, and the technological skills to create them are now globally distributed. Finally, the data themselves respect no national boundaries. They depict natural and manmade conditions of great human and economic importance, and conditions which frequently transcend political boundaries.

The expanded application of these data to human needs, both physical and intellectual, is impeded not by data interpretation, technological feasibility, or even further market development, but rather by the underlying system economics. On the one hand, the nations of the world are cooperating in the sharing of meteorological and oceanic data and of the cost of system manufacture, and on the other several nations are planning or building duplicative, overlapping systems. While the latter situation is tolerable for the early years of a nation's space program, the former is a better model for the future, and for the whole of Earth observations.

System economies can be improved by the elimination of duplicative systems, the reduction of overhead costs, expansion of the market, and potentially the use of astronauts for system repair and replacement. The first three of these were successfully achieved in satellite communications by Intelsat. The last may be a byproduct of the Space Shuttle, space station, and Hermes programs, to the extent that polar-orbiting capability is provided.

The inherently global science of Earth observations, encompassing all of the disciplines (meteorology, oceanography, geology, etc.), is accompanied by global needs and capabilities, and offers the opportunity for enhanced international cooperation and the shared economic gains mentioned above. This can be accomplished through the creation of an international consortium for Earth observations that is modeled on

Intelsat. Initial membership could include the member nations of the European Space Agency, Japan, the United States, and others. The responsibility of the entity would initially extend to the provision of Earth observations (atmosphere, ocean, and land) and related services from sun-synchronous, near-polar orbit. Related services would include data collection and search-and-rescue. Ultimately, the responsibility could grow to include a ring of geostationary environmental monitoring satellites as well.

Such an organization could also serve the science community, as many Earth- sciences research issues must be addressed by a combination of long-term operational and targeted shorter-term research instruments. Further, its spacecraft would provide a convenient marshalling point for selected research, as well as operational, instruments.

The United States should therefore begin discussion with its current space partners to start the process for the establishment of a new international commercial consortium for Earth observations.

Space Debris. Another potentially valuable area for international coordination is the growing problem of space debris, with which AIAA has been concerned for over seven years. The Institute's July 1981 position paper "Space Debris" predicted that the problem would become serious in the 1990s if proper steps were not taken. Recent data clearly support that prediction. A new factor is the potential effect of SDI and comparable Soviet experiments.

Precautions to reduce the growth of space debris could be taken by international agreement; for example, venting all pressure vessels at the end of their life, capturing all explosively-actuated devices, assuring timely Earth entry of all abandoned low-Earth-orbit spacecraft, etc. These and other anti- debris methods would only be effective if adopted on an international basis. However, before the U.S. pursues international adjudication of the space debris problem, a national policy must be developed, after which establishment of international agreements should be sought to provide guidelines for acceptable control and disposal of space debris.

Global Education. One of the major opportunities for international involvement in the 1990s is global education by satellite. The United States is in a good position to assume a leading role.

The need for an international approach at all levels of education throughout the world is evident, and it is urgent — even desperate – for adult populations in many developing countries. As demonstrated by the Advanced Technology Satellite program and others, satellites can be used increasingly for education in hygiene and public health, agricultural methods, language, and social inter-relations. Space instruction at higher levels needs to be provided in biology and medicine, chemistry and physics, geology and hydrology, and various applied sciences. An important example in medicine is the use of satellites for immediate assistance in diagnostics and in carrying out surgical operations with complications when a physician who has international credentials resides in one country and the operation is conducted in another. Programs in the arts and entertainment could also be exchanged on a regular basis and language barriers breached. Clearly, an international effort needs to be established to promote the use of satellites for broad aspects of education throughout the world, especially in developing countries, with easy access and low cost.

Technology Transfer has long been recognized as one of the most difficult aspects of international cooperation. Much has been written about the adverse consequences to security and commercial competitive position as a result of the leakage of American technology to other nations, friendly and unfriendly. Protective measures designed to minimize the loss have, in some instances, caused negative results in the U.S. itself. For instance, a penalty is imposed on U.S. scientists, engineers and graduate students, and therefore U.S. innovative potential, by the substantial reduction in recent years in the flow of open unclassified information on some of the most interesting and important technical disciplines. Also, U.S. aerospace firms are losing international business opportunities to foreign competitors who are just as advanced in some technologies. Steps should be taken to more systematically disseminate foreign technical literature to U.S. professionals. The current federal technology transfer policy diminishes the possibilities for cooperative aerospace agreements between U.S. and foreign governments, because the latter are reluctant to participate in arrangements which overly limit their access to certain technologies.

In a 1984 position paper, "Communicating Technical Information," the AIAA called for reducing to a minimum the items on the Militarily Critical Technologies List (MCTL) by creating disciplinary peer groups with the background and knowledge of the worldwide literature needed to judge which unclassified technologies are already sufficiently well-known to warrant removal from the MCTL. Although the MCTL has recently been reviewed in this context, the evolutionary nature of science technology requires frequent reevaluation of the list. Such reviews should, of course, reflect the overall security interests of the U.S. and its allies in denying access to classified technology.

Commercialization

NASA is primarily an R&D agency and cannot itself engage in commercial activities. In a number of instances, such as satellite communications technology and meteorological satellites, NASA space R&D has been spun off to the private sector or to other user agencies.

By Presidential direction there is a current effort to increase the use of space and its technologies by the private sector. Two laws were enacted in 1984 – the Commercial Space Launch Act and the Land Remote Sensing Commercialization Act – followed by several other government actions. The Department of Transportation has set up an Office of Commercial Space Transportation; the White House has created an Interagency Commercial Space Working Group; and NASA has set up an Office of Commercial Programs to encourage

FREE-WORLD GOVERNMENT CIVIL SPACE APPLICATIONS BUDGETS*

(APPROXIMATE: IN MILLIONS OF THEN-YEAR U.S. DOLLARS)

ENTITY	SATELLITE COMMUNICATIONS		REMOTE SENSING		MATERIALS PROCESSING	
	1983/84	1986	1983/84	1986	1983/84	1986
European Space Agency	222	249	41	198	75	39
France	52	105	92	120	8	14
West Germany	100	30	5	8	22	32
Japan	73	109	66	99	9	14
Canada	33	36	35	43	N/A**	N/A
Total	480	529	239	468	114	99
Unites States	32	100	15	24	22	35

*Data for U.K. and Italy unavailable.

**Not available.

commercial space activities. NASA has also moved to involve commercial firms more actively in Shuttle turnaround processing, space transportation, space-station design, development, and operations, and other major programs. NASA's Office of Commercial Programs has acted to increase aerospace and nonaerospace private-sector awareness of space opportunities and to encourage more industry investment and participation in space-based product R&D, employing Joint Endeavor Agreements (JEAs) and Technology Exchange Agreements (TEAs). The Office has also funded nine Centers for the Commercial Development of Space.

All these efforts have raised the interest level of potential investors, but have not yet inspired much actual investment. Most space activities involve high economic risk and long-term commitments of resources, which commercial organizations have been unwilling to undertake, even when incentives such as R&D and investment tax credits were still available. While communication satellite profitability can be assessed directly, many other proposed space commercialization activities are speculative and are perceived to have unacceptable risk for investment purposes.

NASA can make commercialization more attractive by increased efforts on high-technology space-based process and product R&D such as microgravity processing; by technical developments, particularly in civil remote sensing and communications; and by establishing a long-term, consistent pricing and operations policy for transportation, facilities, and other services.

But by far the most important element in meeting vigorous foreign competition in commercial space developments is a substantial increase in federal support for research and facilities. The accompanying chart shows the relative support for commercially related space activities currently being provided by foreign governments, as compared with U.S. efforts.

In remote sensing, if U.S. commercial systems derived from Landsat are to compete with the French SPOT and the Japanese ERS series, the government must honor its commitments in the transfer of Earth-observation functions to the private sector, as discussed earlier. Moreover, U.S. systems will need, among other enabling technologies, high-resolution multispectral sensors and ocean color instruments, particularly "push-broom" sensors (like SPOT's) using charge-coupled devices.

In communications, the Advanced Communications Technology Satellite (ACTS) demonstration program has been cited previously as an essential element in bringing U.S. capabilities up to levels beyond those already achieved by Japan in Ka-band (30/20 GHz) operations and baseband switching, and must continue to be pursued vigorously.

Space manufacturing and processing activities are thought to have high potential, particularly by European and Japanese interests. However, there are not yet sufficient data from NASA's low-level microgravity science and technology development program to interest many U.S. investors. Therefore NASA should continue to develop vigorously a more effective program to demonstrate the technical benefits of the space environment to potential users, and should coordinate the agency's microgravity science programs with the commercial programs office to ensure the practical direction of funded R&D programs. In addition, more flight opportunities than are currently available are required to conduct the needed research. The government must accept its role as the principal supporter of basic and applied research and commit the necessary resources, including reasonable support services, to provide microgravity research facilities.

NASA should continue to encourage private sector participation in space by the use of JEAs and TEAs, and the agency should also consider lease arrangements for privately-owned space assets to attract venture capital and reduce overall costs for new laboratory facilities needed to conduct research and commercial development activities. Further, the government must recognize the importance of its procurement policies to commercial space ventures, and move aggressively to implement administration promises to purchase products and services from the private sector.

Space Station

The original goal of the space station program, as stated by President Reagan, was to have a permanently manned station in orbit by 1994 or sooner. Besides meeting the near-term objective of supporting advances in space science, technology, and commercialization, the station is a key element in the space infrastructure necessary to accomplish goals and objectives of the type suggested by the National Commission on Space. The continuing presence, since 1971, of manned Soviet stations in orbit, and particularly the stated Soviet intention to use the new Mir station to establish a large permanent facility and offer its facilities to western nations, must be considered in the context of U.S. plans.

The current U.S. space-station program is proposed as the next major step towards manned space utilization. A baseline design configuration has evolved which attempts to satisfy concurrently all user application needs; e.g., observation, materials processing, life sciences, technology, and servicing. That configuration, however, does not yet reflect changes in the U.S. launch fleet that will certainly take place when launch operations resume. Even with a fourth orbiter to replace Challenger, the new projected Shuttle flight rate may not be able to support timely assembly of the initial station, its projected logistics requirements, and crew safety considerations without seriously limiting space-station payload deployment or other NASA commitments. Further, it is possible that simultaneously fulfilling all the abovementioned user requirements, while at the same time seeking significant technology advancements, could increase cost beyond budget estimates.

The space station, then, could fall into the same trap as befell the Shuttle: near-term budget availability could become inconsistent with long-term low operational cost objectives. NASA recognized this situation in July 1986 and has reexamined the space station program plan to introduce the flexibility needed to accommodate these uncertainties.

Because the space station's low-Earth-orbit operational capability is essential to U.S. preeminence in space and to future space initiatives such as those proposed by the National Commission on Space, it should be budgeted to meet the scheduled 1994 deployment date. However, NASA's program plan must have sufficient flexibility to phase in transportation support, safe and practicable assembly, user accommodation, and advanced technology realistically in terms of both budget and schedule. The recent launch vehicle failures and the subsequent curtailment of U.S. launch capability clearly point out the need for alternate and redundant transportation modes to deploy and supply the station and provide emergency crew return. Hence the station design should be revisited to take advantage of the launch capabilities of both the Shuttle and expendable launch vehicles (U.S., European, and Japanese). NASA should continue to seek maximum practical use of advanced technologies, particularly automation and robotics, and to seek the interest of the private sector in any particular segments of the system that can be made attractive to commercial interests.

President Reagan has called for substantial foreign participation in the space station program, an inherently sound policy but one which introduces some degree of ambivalence. On the one hand, the growth of foreign technological and economic strength makes possible substantial contributions to the program that increase the capability of the system. On the other hand, as an investment of U.S. funds, the space station program must give highest priority to supporting the needs of the U.S. public and the private sector rather than those of its overseas partners.

NASA is currently negotiating agreements (1) with Europe, for their investment of up to $2 billion toward development of a pressurized laboratory called Columbus, a resource module, a free-flying polar-orbit platform, and a free-flying co-orbiting platform; (2) with Japan, to invest up to $1 billion for development of an experiment module with a remote manipulator arm and an attached logistics module; and (3) with Canada, to invest up to $500 million to develop a mobile remote manipulator system.

To achieve the positive benefits of cooperation, the international partners must be assured of a serious, long-term U.S. commitment to the program. They must also be treated as major shareholders who are participating in the program in pursuit of their own legitimate objectives. Past cooperative ventures, while overwhelmingly successful in general, have demonstrated U.S. inconsistencies and the pursuit of unilateral advantages inimical to cooperation. The International Solar Polar Mission is usually quoted as an example of the first, and the European investment of $800 million in Spacelab, for which they believe they received little in return, is perhaps the best example of the second. The space-station negotiations are accompanied, therefore, by a degree of suspicion that can only be assuaged by careful attention to the reasons for that suspicion. Congressional restrictions on foreign space-station activities, for example, have unnecessarily complicated the negotiations.

To avoid potential negative effects of cooperation, equal attention must be paid to three elements: (1) achievement of a satisfactory quid-pro-quo, (2) equitable arrangements for the distribution of operational costs, and (3) the active pursuit of a U.S. program to employ the space station infrastructure.

With respect to the first, the potentially conflicting objectives of the partners must be acknowledged. For example, the Europeans have made it clear that they expect their participation to lead eventually to autonomous European manned space capability, and the Japanese want both to enhance their own space development abilities and to apply space technologies in their Earth-based industries to make them more competitive. These are not reasons to avoid cooperation, only objectives that must be understood in the negotiation process. NASA must ensure that the U.S. participates fully in those elements of the space station that lead to long-term economic, scientific, and technological gain.

With respect to operational costs, and because NASA will provide the largest segment of the core infrastructure, consideration should be given to sharing the total operations cost on a use-based formula, rather than on a contributed subsystem-only basis or similar formulas that would not reflect the total burden. NASA's current efforts in this area are encouraged.

These steps are necessary, but assure only that costs are equitably distributed. Benefits will be proportional to the vigor with which a nation employs the space station resource. If the U.S. investment in the program is not accompanied by a strong exploitation of the capability, the preceding precautions will be futile. The concerns that have been expressed by several members of Congress that NASA will "give away the store" in the space-station negotiations will then be real. But the best way for the U.S. to stay ahead of its foreign competitors, both in the space station and in other high-technology areas, is to move faster and more effectively than they do in research and technology development, not to bar their cooperative participation in developing new and potentially valuable space facilities.

Education

The consequences of the space crisis of 1986 are already evident, primarily in the reassessment of past practices and systems. Perhaps the most important result of the crisis, however, is the opportunity it offers for renewed and vigorous attention to the motivation of the next generation – those who will manage and conduct the nation's space programs in the future.

The last major reform in science and engineering education in the U.S. occurred with the National Defense Education Act of 1958, in response to the challenge of Sputnik. Conditions have since deteriorated at all levels of the U.S. education system, from elementary to graduate school. Differing but related obstacles must be overcome at each level to correct the future potential shortage of qualified human resources needed to carry the space program into the next century.

At the elementary school level, many teachers are reluctant to incorporate science and technical subjects in their curricula, because they are neither prepared through proper background nor equipped with appropriate teaching materials to present such subjects adequately.

At the high school level, conditions have deteriorated to the point at which less than half of high school juniors and less than one third of seniors take a science course, according to the National Science Board's 1985 report on "Science Indicators." The consequences, according to recent surveys, are that an estimated 90% of U.S. high-school graduates are unable to undertake even routine high-technology tasks, and only 6% of U.S. high-school graduates are proficient in math and science as contrasted with 90% in Europe and Japan. A shortage of qualified science and math teachers, exacerbated by unattractive salaries and teaching conditions, is producing an even smaller pool of candidates for undergraduate university engineering programs. The undergraduate university science and engineering programs in the U.S. suffer from faculty limitations, both in number and in quality, and from curricula which in many cases have not adequately adapted to meet the changing needs of the professions they feed.

The graduate engineering education crisis is reflected in the decreasing fraction of U.S. students in aerospace-related graduate departments, where high-quality foreign students, many of whom return to their homelands, are often in the majority. The limitations of the faculty and the lack of adequate up-to-date laboratory and research facilities are major contributors. The attractiveness of entry-level salaries in industry has also contributed to the shortage of qualified undergraduates willing to make the commitment to full-time graduate school, according to the National Science Board.

Some of these concerns are reviewed in the report of the National Commission on Space, which concludes that the space program in general, and NASA in particular, could be a major influence in reshaping U.S. science and engineering education from elementary to postgraduate levels, as occurred after Sputnik. The five actions proposed by the Commission are that educational initiatives centered on the space program be used to motivate young people toward science and technology from elementary through high school, that Congress authorize a vigorous NASA graduate fellowship program, that funding be increased for university space research and technology programs administered by federal agencies, that NASA undertake a program to upgrade space research equipment, and that more frequent suborbital and orbital experiment opportunities be provided by NASA to university research programs.

Several additional programs could further address the specific issues at each level of the U.S. educational system. Recognizing that the influence of the space program at the elementary through high-school levels is to provide incentive and inspiration for future space-related careers, a central clearinghouse should be established for the dissemination of educational materials focusing on the space program. Private ventures such as the Young Astronauts Program and "Space Camps", as well as the "Teacher in Space" program and the Children's Challenger Center for Space Science (created by the families of the Challenger crew), should be supported to foster enthusiasm for the space program at the elementary and secondary-school levels.

The vitality of the future U.S. civil space program is inextricably tied to the improvement of both the quantity and quality of engineering graduates emerging each year from U.S. colleges and universities. New and innovative approaches to achieve such improvement should be emphasized, including expansion of "co-op" programs to the graduate level, establishment of Centers of Excellence at those universities with specific disciplinary strengths, development of curricula in astronautics and in space science, providing more summer employment opportunities for bright students at NASA centers and in industry, the temporary assignment or loan of senior industry engineers to teaching positions in major universities, attracting early-retirement engineers to the teaching profession, and having NASA technical personnel serve as grant monitors for university research.

Unless the youth of this nation are strongly motivated to seek their careers in the often difficult fields of science and technology – of which space is a particularly exciting and rewarding constituent – no amount of federal program emphasis can by itself sustain a long-term leadership role for the U.S. in civil space activities.

INADEQUATE FUNDING FOR CIVILIAN SPACE

Mr. HIEATT. Thank you. To summarize the conclusion of this workshop, AIAA concluded that the national civilian space program currently at the funding level it is receiving will, in fact, never catch up with the rest of the world if we keep going the way we are going. That is the basic conclusion in here, that we are not funding civilian space adequately.

I would like to go quickly through the written testimony on the NASA budget. First, we recommend that NASA include in the budget money for expendable launch vehicles so we can get our launch rate back on track. We endorse, as we have in the past, a full permanent space station. We do not concur with some of the testimony that has come before the Committee in that that is not a constructive way to lead to Mars or to a lunar base.

We agree with the National Commission on Space that we need to increase the science budget. We believe in a balanced budget between science, space technology, and applications, and we don't favor one over the other.

We would like to applaud NASA for maintaining support for its flight programs. We don't agree, in some cases, with what NASA has done in the communications technology area. We feel that they should support communications technology. That has been very important to our economy, and clearly, the only commercial application is better communications satellites, which result from their support. Specifically, we that ask this be reinstated in the budget.

We also agree with the National Commission on Space that more money is needed for technology, for basic technology, to keep us competitive in the world in space. We were very, very pleased to see the civilian space technology initiative that NASA started. We think that is the right step, but increased funds should go into that initiative in subsequent years. We were very happy to see that the Senate authorization markup embraced many of the recommendations that we have had in our testimony.

AERONAUTICS PORTION OF NASA BUDGET

I would like to introduce Norris Krone, who will comment on the aeronautics portion of the NASA budget.

Senator PROXMIRE. Mr. Krone, go right ahead, sir.

Mr. KRONE. Thank you, sir. We don't necessarily agree that Amtrack is the answer, incidentally.

Relative to the aeronautics portion of the NASA budget, I would like to make a point that the balance of trade of aeronautics, aircraft, in other words, in the world last year in favor of the United States was $10.9 billion.

The bad news is that is a drop of about 14 percent over the previous year. Significantly, the drop is caused by imports; the exports, our exports, maintain their own. As a matter of fact, we are a little higher than in the year before. We are concerned because the key to our export capability is performance of those aircraft, and the key to the performance of the aircraft are the technology programs that are going on today.

The NASA budget has been maintained relative to the aeronautics side and is approximately constant over the last few years. That causes a problem in that, and I will use an example of a flight control area, where a few years ago, wires, pullies, springs and simple force mechanisms were all there was to it. Now there is complicated architecture, multiplexing architectures, redundant computers, millions of lines of software and, essentially, a need for much greater capabilities and support.

The point is that in order to progress, we need to go to greater levels of resources to make those progressions. We consider the aeronautics as an investment area. That is really the key to our plea for greater support for aeronautics.

Thank you, sir.

Senator PROXMIRE. Thank you, sir, very much.

[The statement follows:]

JOINT STATEMENT OF JAMES L. HIEATT, CHAIRMAN, AIAA SPACE SYSTEMS TECHNICAL COMMITTEE, AND DR. NORRIS KRONE, CHAIRMAN, AIAA ADVISORY COMMITTEE ON NATIONAL AERONAUTICS

Mr. Chairman, the American Institute of Aeronautics and Astronautics (AIAA) again thanks you for this opportunity to present its views as you consider the NASA budget for FY 1988.

AIAA is a non-profit professional society dedicated to advancing the art, science, and technology of aeronautics and astronautics and to nurturing and promoting the professionalism of those engaged in these pursuits. We have a membership of over 40,000 drawn from American industry, academia, and government as well as from numerous other nations.

Our testimony today is based on an AIAA workshop held last summer to assess the nation's posture in space and reflects the considered judgment of the nation's leading aerospace professionals. A copy of the Assessment based on that workshop has been provided to your committee, and we would like to request that it be included in the record.

We believe that, a year after the Challenger accident, the U.S. civilian space program is still in a crisis situation. Efforts to reconstitute national space policy and to reshape NASA's programs and structure have not yet reflected the realities of our commitment to go into space to stay. What is required is a national commitment to investments in our future in space, a government policy that identifies the goals and milestones to achieve that vision of the future, and then annual budgetary contributions to that space investment portfolio.

The public support for an increased NASA budget is there. Over fifty percent of Americans think that the United States should try to land men and women on Mars within the next twenty-five years. The challenge to the White House and to Congress is to provide the leadership to make that aspiration a reality.

The budget policy of the past two decades will ensure that the U.S. becomes and remains a second-class power in space. The choice is not simply to select among fixed-budget alternatives, but to formulate a set of civil space goals with milestone objectives, and then commit the funding needed to proceed with the attainment of those goals. It is important that those responsible for government budget policy invest in areas such as space, which creates future capabilities, leading to economic growth, government revenue, and the ability to fund future government activities.

Space Transportation: Adequate transportation capability is essential to our ability to utilize and exploit space. It is AIAA's position that the government must give highest priority to re-establishing the United States launch capability by 1) creating a mixed fleet of Shuttles and expendable launch vehicles; 2) returning the Space Shuttle to flight status, and 3) reducing the cost of transportation to space.

Recent space launch failures have forced a review of America's space policy. At last summer's AIAA Expendable Launch Vehicle Workshop there was unanimous agreement that the nation could no longer afford to depend upon a single launch system. Initial funds to allow NASA to procure adequate ELVs to carry out this strategy should be included in the FY 88 budget.

Space Station: As we have testified before, a permanently manned space station is important to near-term scientific, technical and commercial progress. It also supports the pursuit of long-term goals such as those proposed by the National Commission on Space (NCOS). However, NASA's program plan must have sufficient flexibility to phase in transportation support, user accommodation, and advanced technology realistically in terms of both budget and schedule. In that regard, it is desirable to consider space station approaches which: accommodate the use of ELVs in addition to the Shuttle for deployment, resupply, and operations (including compatibility with European and Japanese vehicles), provide for emergency crew return, and are compatible with attaining significant initial operating capability in the mid-1990s.

Space Science and Applications: In its recent Assessment of the civil space program the AIAA Space Task Force called for a doubling of the space science budget over an appropriate period of time in accordance with the recommendations of the science community. The FY 88 budget proposes a $34 million reduction from FY 87.

After 30 years of impressive accomplishment, U.S. space scientists are now experiencing a traumatic disrupton in their access to space. The NASA Space and Earth Sciences Advisory Committee (SESAC) in a recent report has identified our present situation as a crisis. We concur with this evaluation, and with the remedies proposed by SESAC.

The AIAA views with considerable dismay the proposed further delay of the Mars Observer. When originally approved, this proposed program was to be a quickly-executed, low-cost, very worthwhile planetary science mission, one that would be an integral element of the strategy developed by the Solar System Exploration Committee. The program was designed to require only three years from start to launch in 1988 and to cost about $165 million. The launch has already been delayed two years to 1990. This has resulted in a substantial cost increase. It is now proposed that the launch be further delayed until 1992 in order to reflect the priorities embodied in the current Shuttle launch schedule. This will further increase the cost and reduce the possibility of meaningful collaboration with the Soviets' Mars exploration. The Mars Observer can be launched by the Titan III booster, and this would be a major step in getting our space science program moving forward.

NASA is commended for its continued support of major flight programs now under development such as TOPEX, HST, GRO, UARS, and others.

As we testified last year, the AIAA advocates an increase in the funding of the Explorer Missions and funding for the development of instruments for small payloads as experiments-of-opportunity on spacecraft launched by the DOD, NOAA, or foreign programs (as for example, SOLAR-A). An increase in the overall science budget would permit support for these high-payoff, relatively low-cost areas.

AIAA feels strongly that it is in the best interest of the U.S. to participate in joint planetary exploration missions with other space-faring nations in the 1990s. In particular, we recommend consideration of coordinated U.S./Soviet Mars exploration, beginning with orbiters, progressing to unmanned rover and sample return missions and culminating in a joint manned Mars mission.

Space Applications: Space leadership and its economic benefits to the nation are both at stake in commercial space activities.

Strong foreign intiatives in space processing, satellite communications, and remote sensing are not being adequately matched by U.S. programs, primarily because of inadequate support for technology advancement and research facilities.

NASA's role in communications satellite research and development should be to provide a solid technology base that will bring the risks of developing advanced communications satellites into an acceptable range for U.S. industry. We believe that adequate progress on these generic research and technology development programs will require an FY 88 funding level signficantly higher than the current $14.4 million NASA budget estimate for communications research and analysis.

In light of the above, and given the substantial investment to date in the Advanced Communications Technology Satellite (ACTS) program, we strongly recommend that ACTS be reinstated in the NASA budget and the program brought efficently to completion.

For the past several years the AIAA has advocated a substantially increased effort in the area of commercial use of space. We feel that present plans and policies are inadequate for materials processing in space and the commercial use of related space facilities. The impact of the Challenger accident has been to severely limit regular access to space by the private sector, and commercial uses of space have been given low priority in NASA's recovery plan. As one way of providing increased access, we recommend that NASA and DOD consider developing a coordinated plan for accommodating commercial payloads on DOD flights.

Space Technology: AIAA supports the recommendation of the National Commission on Space for a three-fold increase in funding for space technology advancement. AIAA applauds the proposed Civilian Space Technology Initiative. Increased funding for technology development is a most desirable step in the direction of continued United States leadership in space. However, we agree with NCOS that an even greater commitment of resources is needed.

The Status of National Aeronautics

As a technical organization the AIAA is naturally oriented towards the future capabilities of our aeronautical products. The competitiveness of tomorrow's commercial products in world markets and the superiority of future military aircraft are directly related to the level of support given to today's aeronautical technology efforts.

Our message today can be characterized by one word--concern. The concern is that relative to the competition, the trend of our worldwide leadership in aeronautics is in a downward direction, and it has a downward slope of significant magnitude. For example, aeronautical products have been a very bright spot in the dismal balance of trade picture for a number of years, but the brightness is fading. In 1986 the balance was approximately $10.9 billion in our favor; however, it represented a 14 percent drop from the previous year. The drop was not caused by a reduction of our aircraft exports (which actually increased by about 3 percent), but by a huge increase in imports, which went from approximately $4.5 billion in 1985 to $6.1 billion in 1986.

The question then becomes, is there an opportunity to reverse the situation and create a positive trend in our worldwide position in aeronautics? We believe the answer to this question is a definite yes. We base this belief on the potential large gains in aircraft performance that are possible through the integration of advancements in several technology areas.

The AIAA conducted an aeronautical workshop in late 1986 to focus on reversing the adverse trend in aeronautics and to recommend specific implementation actions. The most important of our recommendations calls for increased funding investments in support of specific technology programs that can lead to superior aircraft performance (both military and commercial) and increase future sales. In recent years foreign governments have been furnishing more and more direct support to their aircraft industries, both for specific aircraft development and for technology development programs. In addition, these governments either own the industry or support consolidation practices that would violate current anti-trust statutes in the U.S. We must increase our funding levels accordingly.

NASA FY 88 Aeronautics Program

General Level: The FY 88 NASA budget allocated for aeronautics is insufficient to maintain U.S. world leadership in aeronautics. Of the total $9.5 billion requested for NASA in FY 88, $679.0 million (or about 7 percent) is allocated for aeronautics, and of this only $375.0 million is for Research and Development.

The reason for the low aeronautics R & D level is not its lack of importance but rather the high (and properly so) priority attached to NASA's efforts to maintain U.S. leadership in space. Under the severe restrictions on increases in the total funding level, the aeronautics programs are forced to continue with inadequate funding.

We believe NASA does a good job of managing the available resources and that they understand the areas of deficiency; however, they are faced with an enormous unsolvable problem under the current funding level and are spread alarmingly thin. As the technology becomes more and more sophisticated, the hardware and software become more complex, and the resources needed to make advances increase proportionately. This is true in all the disciplines that make up the aeronautical "technology base." For example, the flight controls of aircraft in the late 40s and 50s consisted of little more than mechanical systems of cranks, pulleys, springs, wire, and simple force and feel mechanisms. In sharp contrast, the control system requirements of the next generation aircraft dictate a mind-boggling level of complexity involving sophisticated multiplexing architectures, numerous redundant computers, and millions of lines of software.

Our major point is that in real terms the NASA aeronautics R & D program is being significantly *reduced* by virtue of receiving a fairly constant funding level year after year.

Technology Base Programs: Because of these low and approximately constant funding levels, all principal areas of the technology base programs are in need of strengthening--examples are the structures and flow prediction areas.

Advanced Materials and Structures - There is an immense potential for vehicle performance gains through the use of advanced materials in primary structures and in engine hot sections. For example, the increase in turbine hot section temperature and lighter structures have made possible an order of magnitude reduction in a long-range cruise missile weight, size, and cost over that possible with the technology levels of a decade ago. Much more effort is needed in the areas of material characterization, fatigue, manufacturing and inspection techniques, and cost reduction.

Fluid Flow Prediction and Verification - The accurate prediction of flow fields around actual air vehicle exterior configurations or through the propulsion systems remains an area that requires much effort and large investments. The computational methods are far from perfect. The NASA budget reflects a good appreciation of this situation. However, there remains a shortage of resources to verify (by wind tunnel and flight test) the accuracy of the emerging methods and to define their limitations (when they work and when they don't and why).

NASA Research and Development Facilities: We recommend supplemental funding for a major upgrading of NASA's wind tunnel facilities. For many years this essential area has been underfunded. We must refurbish existing facilities and examine areas where technology has moved beyond their capabilities. Most of NASA's 16 major tunnels have been operating for over a generation and are restricted in their use (the 12 foot tunnel at Ames is an example). There exist critical shortcomings in our ability to conduct systems research simulation in hypersonic aerodynamics, propulsion and high temperature structures. The cost of upgrading these old facilities and the creation of new ones is so high that a national investment is essential.

Technology Demonstration Flight Programs: We recommend supplemental funding (on a yearly basis) dedicated to supporting technology demonstration programs. Flight research is required to fill the gap created by ground test facilities which do not adequately cover the entire flight regime of future operational vehicles.

Conclusion: The aeronautics industry is of critical importance to the nation's security and economic well-being. The future health of this industry is directly related to the investment we make in today's aeronautical technology programs. With a projection of over $500 billion dollars in worldwide aircraft sales during the next ten years, it is essential that we make the necessary investments in technology development today. These investments in the past have given us our current position of leadership, and they will pay large dividends in the future. Based on this, we strongly recomend a strengthening of the NASA aeronautics funding in FY 88.

STATEMENT OF DR. STEVEN FLAJSER, CHAIRMAN, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

Senator PROXMIRE. Dr. Flajser?

Please correct me on that pronunciation.

Mr. FLAJSER. It is quite correct, Mr. Chairman. Thank you. It is not even a Dutch-German name.

IEEE is very honored to be here appearing before the subcommittee, and I will not get into details of the reading the specific statement and ask that it be included in the record. I will summarize, as you requested.

Senator PROXMIRE. We will put it in the record without objection.

Mr. FLAJSER. The first comment we would make is that last year when we testified before the Congress, it was shortly after the *Challenger* accident. We were, as well as the rest of the nation, concerned about that. We were also very much involved in looking at the National Commission on Space and what they were doing in charting long-range goals.

In retrospect, we would like to commend, in particular, this subcommittee for what they did in funding the fourth shuttle replacement orbiter which we felt was a national asset required by NASA and the rest of the nation and for funding it in such a way so that it did not come out of the hide of other NASA programs.

NEED FOR NATIONAL GOALS

This year, what we did was try to take a look at more short-term requirements, and that is, a need for national goals in space and particularly, the need to regain U.S. competitiveness and leadership in space.

We observed that this year marks the 30th anniversary of the launch of Sputnik. That was a period where the United States clearly was behind another nation. We caught up and surpassed that nation, and 30 years later, we find ourselves somewhat similarly behind in various areas of space science and technology.

Much of what we say in our statement is focused upon the need to regain that preeminence and leadership.

We feel that to do that, we need a clear sense of national objectives, and we offer, appended to our statement, about a two- to three-page policy position paper on what those national objectives should be.

Specifically, there are several points that we would like to make. No. 1, we continue to support the need for that fourth shuttle orbiter.

SPACE STATION DEVELOPMENT

Second, we continue to support the development of a space station, and here, I would like to specifically quote from our policy position, because there has been a lot of discussion, pro and con, with regard to the space station which led us to this particular paragraph.

Establishing a permanent presence in space is an essential step toward reinvigorating the U.S. civilian space program. However, given the severe budget deficit facing the federal government, the rationale and consequences behind funding an expensive enterprise such as a space station must be fully understood. We must establish definitive objectives for a balanced U.S. civilian space program within which a space station would be one element.

We view the space station essentially as a means to an end, not an end in itself. We are particularly concerned about the question of balance, and there are three points we would like to make in that regard.

No. 1, a space station without the associated space science and applications programs would not constitute a national balanced space program, which we endorse.

DEPARTMENT OF DEFENSE SHIFT

We have two additional perspectives. One is: Without a space station, we feel balance is a critical element where the United States would lose. If we did not pursue a space station program, we believe that U.S. technological leadership and personnel and expertise would further gravitate to the Department of Defense and its associated space program.

The aerospace industry already, necessarily, is moving in that direction because of the vast programs it has. Without the space station, we believe NASA would continue to atrophy, and some of the expertise which would work with NASA would, again, go to the Department of Defense.

We don't question the national security objectives of the nation; we just feel you have to have a strong and balanced civilian side, as well.

The last comment with regard to balance is we feel that if the United States does not have a space station, the international community would further gravitate toward the Soviet Union, and we don't believe that is in our interests from a research and technology base.

I see the red light is on. Let me just refer in summary to seven goals that we have in the statement which specifically gear our comments to the NASA budget for fiscal year 1988 dealing with applications. We support the reinstatement of the acts money. Dealing with space science, we believe that is the area in space science that has suffered most severely as a result of the *Challenger* accident.

We feel there is a real requirement for additional flight opportunities. We talk about the need for a mixed ELV and shuttle need. We talk about the commercial opportunities in space and, particularly, the programs within NASA dealing with materials processing.

We talk about the planetary program and the need for conclusion in the advanced technology activity in NASA, the certain seed money for the future.

One final comment. With our great emphasis on leadership and competitiveness, we don't want to lose sight of the fact that leadership does not necessarily mean just competition; it also means cooperation. One area in which the Congress, in particular, is taking a leadership roam, and Senator Matsunaga, has been the international space year of 1992. We support its objectives. I think leadership in any case involves cooperation.

Next year, we hope to have some recommendations in that area. Thank you, Mr. Chairman.

Senator PROXMIRE. Thank you very much.

[The statement follows:]

STATEMENT OF DR. STEVEN FLAJSER, CHAIRMAN, IEEE AEROSPACE RESEARCH AND DEVELOPMENT COMMITTEE, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Summary Points

- Establish overriding objectives and goals for U.S. Civilian Space Program (IEEE Position Paper makes recommendations for goals)
- Support continued development of the Space Station in the context of a balanced space program
- Restoration of $75 Million to support development of the Advanced Communications Technology Satellite (ACTS) program
- Support increase in the number of science missions
- Support mixed transportation fleet of both Shuttle and Expendable Launch Vehicles
- Augmentation of Life Sciences budget
- Support University research directed "vitality package"
- Support Civilian Space Technology Initiative (CSTI)

Mr. Chairman, and Members of the Subcommittee, the IEEE is honored to be invited again this year to provide its views on the NASA budget request.

The IEEE is the world's largest technical professional society with over 282,000 members in 157 countries. In the United States, there are more than 228,000 members, working in industry, Government and academia. Our members are active in a wide range of technologies that are important to the space program and to U.S. industrial competitiveness. We therefore have a special interest in the future of the U.S. space program and the role that this program plays in fostering the technological advances that will continue to fuel the high technology needs of our national industrial enterprise. Our views represent an amalgam of perspectives, many of which are not necessarily allied just with NASA or its program.

Last year when we testified before the Congress, it was less than one month after the Challenger accident. Much of our attention was focused on the needed steps to recover from the accident. It is encouraging to us how much has happened to get the U.S. space program (civilian and defense) back on track. We commend in particular steps taken by the Congress to purchase an additional shuttle orbiter, and to do so up front, without having to take the money from other, already-impacted NASA programs.

In the course of the past year, the IEEE has reviewed its own policy position regarding the U.S. Civilian Space program and through our U.S. Activities Board developed a new position statement. The position statement is appended to this testimony. The statement emphasizes the need for a national declaration of goals for the U.S. space program that will help ensure regaining our leadership position--a primary goal of the Space Act of 1958.

Our testimony last year on the NASA budget was guided by our comments before the Paine Commission where we articulated some longer range goals. This year, our testimony on NASA's FY'88 budget is guided by the shorter-term goals (on the order of a decade) listed in our position statement. We find it advantageous to view annual budget requests in the context of certain guideposts.

The year 1987 marks the 30th anniversary of the Soviet Union's launch of Sputnik. That event shocked this nation out of a post-World War II complacency.

Each night, the sky above served to remind us we were behind. In response, our nation mobilized. With political leadership and vision, and the sustained application of human talent and money we were able to overtake Soviet accomplishments and attain world leadership in space.

That leadership was attained largely by the 1961 decision by President Kennedy to set as a national objective the manned landing on and safe return from the moon within the decade. With a continuity of support by Congress and three administrations, that objective was achieved. In so doing, we as a nation obtained huge benefits, social and economic, and in addition, achieved major technological advances.

Highlighting those benefits is not the purpose of this testimony. Rather, we wish to underscore three points. First, to achieve the leadership position in space it took vision, leadership and a commitment to meeting declared national objectives. Second, the benefits that came from the U.S. endeavor were readily demonstrated to others in the international community. They, in turn, realized the need to participate and eventually compete in this arena. In addition to that from the Soviet Union, competition in space today is both broad and deep. Third, even before the Challenger accident our competitive edge was threatened. We had already used up much of the seed corn of the Apollo era. While others invested, the shrinking budgetary support for the U.S. space program did not permit a replenishment of our domestic capability in a balanced fashion.

The IEEE strongly supports maintaining, and in some areas regaining, the U.S. competitive edge in space. To achieve this, we will need to reinvigorate our government, industrial and academic bases. With a declaration of national goals in space and the allocation of sufficient resources for a balanced program, we can do so. With a clear sense of national objectives, various NASA programs and projects would take on greater meaning.

We continue to support the need for purchasing a fourth shuttle orbiter as an essential element of our national capability.

We also continue to support the development of a space station. Quoting from our statement:

> Establishing a permanent presence in space is an essential step toward reinvigorating the United States civilian space program. However, given the severe budget deficit facing the Federal Government, the rationale and consequences behind funding an expensive enterprise such as a space station must be fully understood. We must establish definitive objectives for a balanced United States civilian space program, within which a space station would be one element.

This was drafted even before recent information on cost growth.

To build a space station, one needs to have a set of goals within which it serves as a means, not an end in itself. With an understanding of what our overall space objectives are we can determine better what appropriate design, schedule and cost profiles would be for a space station development.

In addition to goals there is the matter of balance. To have a space station without a healthy space science and applications program would not constitute the balanced program we propose as necessary to our national interest. On the other hand, without a space station, we could not achieve some of the longer range goals for space science, exploration and applications.

The question of balance is important in considering a space station development from two additional perspectives. Without a space station, the U.S. civilian space program would fall even further behind in technological activity and budgetary resources compared to defense space efforts. NASA, long attuned to keeping its vigor through major technological challenges, would atrophy further. The youth and the science and engineering talent of the nation would be attracted even more so to Defense Department aerospace programs. Nevertheless, we do not question the importance of our national security objectives in space; the issue is one of maintaining the vitality of the civilian side through new programs.

The other consideration involving balance deals with the relationship of the U.S. and Soviet space programs. If we were not to pursue a permanent presence in space--a capability the Soviet Union already has well in hand--our standing in the international community would continue to erode. For example, the absence of a U.S. station would drive other nations closer to the Soviet Union for the purpose of using their station, collaborating with them on research and growing to depend on their technology more than ours. Without the likelihood of a U.S. commercial space station or one built by the Defense Department, NASA must take the lead. The U.S. public would likely find it difficult to accept the possibility of the U.S. having to rent space on a Soviet space station.

Mr. Chairman, the IEEE position statement provides seven goals which we will use in commenting on other NASA budget items.

1. Applications for Public and Commercial Purposes

We encourage Congress to help put the "A" back in NASA's OSSA (Office of Space Science and Applications) programs. Before we discuss the importance of the "S" of OSSA, we observe that applications programs suffer in their ability to gather NASA and OMB budgetary support. This is most evident in the inability of the Advanced Communications Technology Satellite (ACTS) program, again, to survive the Administration's budget process.

For the fourth year in a row, IEEE strongly endorses reinstituting funds for ACTS, a program that will help keep U.S. leadership in satellite communications. Satellites, because of their unique technical and market features, will continue to be used for telecommunications purposes, even with fiber optics technology. Whether in the future these satellites and associated ground systems are U.S. or foreign, depends largely on whether ACTS continues. U.S. industry will commercialize the technology after the proof-of-concept work, not at the R&D system stage. We hope Congress will provide the necessary $75M for FY 1988.

NASA has other communications programs worthy of support involving search and rescue and mobile communications. Additional future communications R&D efforts need to be proposed and developed. A long range plan and strategy in this area would be most welcome. We look forward to an upcoming report by the NASA Space Applications Advisory Council (SAAC) in this regard.

In fact, the SAAC has undertaken an effort to respond to a Congressional mandate to develop a strategic plan for NASA's entire applications program. The communications report is the first product; others, dealing with remote sensing, information systems and materials processing are in different stages of preparation. We hope these reports will serve the useful function that the Solar System Exploration Committee report did for the planetary program.

Another example of the need to focus on NASA's applications programs is remote sensing. NASA has relatively strong efforts underway in atmospheric and ocean remote sensing. However, the possible demise of the commercial U.S. Landsat system could seriously affect NASA's research efforts in this area. Questions arise regarding where U.S. researchers will get their data and what role NASA should play in technology development (e.g. sensors).

2. Science missions

One of the clearest losers from the challenger accident has been NASA's Space Science program. Of the 50 science missions that were to fly on the shuttle in these six years, (1986-1992), only 17 are scheduled to fly in the six year period once the shuttle resumes flight. Flight opportunities for science missions on shuttle and expendables need to be increased.

More science missions need to be approved. The existing delays due to shuttle coupled with the lean budgets of previous years have led to a situation where some researchers now feel fortunate if they have one mission opportunity in their professional lifetimes. This situation has been particularly severe in the planetary area where the Galileo, Magellan, Ulysses, and Mars Observer spacecraft have each been delayed by 2-7 years for one reason or another. Furthermore, previous cost-cutting has dictated that there be no second spacecraft for any of these missions. So, if you lose one of these spacecraft, all of the data associated with that mission is quite likely to be lost, and it could take up to a decade to recover from a loss.

This seems to us to be quite an unreasonable amount of risk in such a highly-visible area. While it is too late to protect Galileo, Ulysses and Magellan, additional funding should be considered to build a spare Mars Observer spacecraft.

3. Diversity of Launch Vehicles

The IEEE supports the development in the U.S. of a mixed fleet of launch vehicles. Where science missions cannot be manifested on the shuttle, an ELV should be procured. Where the availability of an ELV could make the launch date of a mission earlier, such as the Mars Observer (from 1992 to 1990), the earlier launch opportunity should be pursued. This all presumes that there is a diversity of transportation available. While this is not the case in the short term, over the next several years the combined efforts of the Air Force, NASA and the commercial sector should hopefully produce such a diversity. The IEEE also strongly supports efforts by NASA and others to reduce sharply the costs of getting into space. We support the National Aerospace Plane and NASA's advanced technology programs aimed at cutting the cost to orbit. Nothing will affect the utilization of space more than driving these costs down.

4. Commercial Opportunities in Space

The IEEE supports NASA's request for materials processing and the Office of Commercial Programs. Research in materials processing is both budget and flight-limited. While we cannot predict where the materials research breakthroughs will come that will lead to social, commercial or national security benefits, we can be certain of two things. Without doing the research and flying experiments, breakthroughs won't occur. Secondly, if there ever is a place where the U.S. competitive edge needs to be ensured, it is here.

NASA's commercial programs are a mixture of old and new. The old includes the highly successful technology utilization efforts which look toward commercial and public spinoffs of technology developed for the space program. The new includes joint industry - university research Centers of Excellence. These centers work in areas, such as materials processing, which show some promise of commercial applications. The relatively new also includes joint endeavor agreements and technical exchange agreements between NASA and industry. We encourage the Subcommittee to support these and other efforts NASA might pursue to nuture private sector investments in space.

5. Exploration of the Solar System

Mr. Chairman, we've already mentioned the severe short fall in the planetary program's budget. If one day, the U.S. decides once again to go to the moon and beyond with manned missions--which IEEE recommends that we do--then we will need to know a great deal more than we do now about human health and survival in a low gravity, high radiation environment. We support an augmentation of the life sciences budget with that goal in mind.

6. University Facilities in Space

Over the longer term, providing research facilities and opportunities for university scientists should be a national objective. However, in the short-term, without flight opportunities, keeping our research base together on earth is critical. We support the modest but important "vitality package" NASA is proposing in the FY'88 budget.

7. Advanced Technology and Longer Term Goals

One of the most important new initiatives in NASA's FY'88 Budget request is the Civilian Space Technology Initiative (CSTI). Space research and technology funding today is about one-quarter of what it was in the 1960s. We are living off the investments of the past and could not readily undertake new initiatives without replenishing the seed corn.

CSTI will focus on a number of areas. Efforts to lower the cost to space will depend on advances in propulsion and booster technology. Higher in-space power requirements in orbit will depend on new technology developments. Likewise, important automation and robotics developments will be targeted by the CSTI programs.

We support this multiyear program and the $70M increase for FY'88. The IEEE also supports an augmentation in the Advanced Programs area which contributes to development of long term goals in the areas of planetary exploration.

Mr. Chairman, we've commented on several NASA programs and more importantly on the need to have a declaration of national goals for space. In our appended policy statement we suggest some goals. We are encouraged by efforts within NASA to produce a set of shorter-term goals to bridge the period of longer term goals set forth by the Paine Commission.

In recommending a declaration of goals, IEEE has been motivated by the need to restore U.S. leadership in space and to regain the competitive edge. Leadership also implies that international cooperation is an important objective. The IEEE finds examples of many international joint ventures, particularly in science, that are in our national and international interest. We support joint ventures and the goals of the International Space Year (ISY) which Congress initiated, scheduled for 1992. As an organization we are working toward making a contribution to this important project.

To summarize, IEEE's view of the NASA budget is that it deserves the Subcommittee's support. We had previously written to Budget Director James Miller encouraging him to support a figure closer to $10B as necessary to help restore a balanced and competitive civilian space program.

The civilian space program led by NASA will generate valuable public and commercial services, increase scientific knowledge and advance our national technology base. We can ill afford not to make the nationally critical investments in our space program during these competitive times.

Thank you for this opportunity to present IEEE's views on the FY 1988 NASA budget.

SUMMARY

In its almost thirty year history the United States Civilian Space Program has placed requirements upon our technology which have resulted in major advances in computers, communications, guidance and control, and remote sensing. In more recent years, other nations have been excelling in technological endeavors which challenge the United States standing in Space Science and Technology. The IEEE United States Activities Board urges the declaration of a set of national goals for our space program which will ensure regaining United States leadership in space, a primary goal of the Space Act in 1958. This Position Statement presents such a set of national goals which, with appropriate budgetary support, should ensure United States leadership in space.

In its almost thirty year history, the United States civilian space program has led to a significant improvement in our understanding of the universe and our own planet. It has provided the means for global communications, remote sensing, and information processing networks. In doing so, its mission needs have created requirements in electronics reliability, miniaturization, weight, cost and versatility surpassing all previous performance standards. Accordingly, the United States space program has been, and continues to be, a critical driver of science and technology.

To meet the space program's needs, major advances have been made in numerous fields of electrotechnology, including computers, communications, guidance and control, and remote sensing. These technological advances have become the foundation for major new high-technology industries which contribute substantially to our nation's economy and balance of trade, and provide a major source of employment for our nation's workforce.

In recent years, the United States has been faced with intense economic competition from abroad. Increasingly, other nations are excelling in technological endeavors which challenge the traditional leadership role of the United States. Space science, exploration and commercialization are not exceptions. The IEEE is concerned that the United States' standing in space science and technology is declining. To reverse this trend, we must recapture the vision and leadership that will enable the commitment of national resources that was exemplified by the Apollo program.

In 1961 President Kennedy announced a definitive objective of the United States space program: the manned landing on and safe return from the moon before the end of the decade. At the time, it was not evident that this objective was possible, nor that any single nation possessed the necessary resources for its fulfillment. With the proper vision, leadership and continuity of national commitment through three consecutive Administrations, the Apollo Program accomplished President Kennedy's objective on July 20, 1969.

The United States is now again on the threshold of a significant new space venture, the space station, which will provide a permanent manned presence in space for research and applications. Establishing a permanent presence in space is an essential step toward reinvigorating the United States civilian space program. However, given the severe budget deficit facing the Federal Government, the rationale and consequences behind funding an expensive enterprise such as a space station must be fully understood. We must establish definitive objectives for a balanced United States civilian space program, within which a space station would be one element. We then must provide the continuity of national commitment that will be required if we are to exploit fully such an effort for our competitive advantage.

A new national consensus on the United States goals in space is necessary. While the National Space Strategy, as approved by President Reagan on August 15, 1984, set forth many of the necessary elements of such a statement of goals, stronger leadership by the Administration and the Congress is required to build the type of national commitment that will make these elements a reality. Declaration of a set of national goals for our space program is needed to provide a clear basis for national consensus over the years to come. The IEEE United States Activities Board recommends the following declaration:

"Because of the technological and economic advantages to be derived by the nation that maintains leadership in space science, exploration and commercialization, the United States commits itself to maintaining preeminence in these fields. This will require a balanced civilian space program. In addition to replacing the shuttle orbiter and keeping the space station on schedule, the United States must allocate sufficient resources to re-establish a robust civilian space program that achieves the following goals within the next decade:

1. Expand the use of advanced applications satellites for public and commercial purposes to improve worldwide communications, navigation and remote sensing;

2. Expand the number of scientific space missions to extend our knowledge of our planet, our solar system, and the Universe;
3. Develop a mix of launch vehicles, expendable as well as reusable, which ensures greater access to orbit and which provides a broader range of payload capabilities;
4. Encourage the public and commercial use and operation of space systems and facilities;
5. Continue our exploration of the solar system;
6. Support in-space research facilities for our universities; and
7. Sponsor the early development of advanced technology required for long-range goals. The highest priority long-range goals are to reduce sharply the costs of building and using space systems, and to establish human settlements on the moon and Mars."

NASA's future budgets must remain substantially higher than the FY 1986 level to provide the steady commitment necessary to achieve these goals. However, support for them will involve more than simply increased Federal funding. The barriers to private sector investments in space commercialization must be removed, and opportunities for international cooperation must be provided in those endeavors that are appropriate. The possibility of one day making space accessible to the general public must also be considered.

In summary, the IEEE United States Activities Board believes that with appropriate budgetary support, the balanced space program outlined above will yield important benefits to the nation through:

1. New public and commercial services,
2. Increased scientific knowledge, and
3. Advancement of the national technology base.

This balanced program will also ensure regaining United States leadership in space, a primary goal of the Space Act of 1958.

STATEMENT OF FATHER WILLIAM GEORGE, GEORGETOWN UNIVERSITY

Senator PROXMIRE. For our next witness, I am a little confused. Apparently, Mr. Harvey and Mr. Collins aren't here. Father William George is representing the two; is that right?

Father GEORGE. Correct, Mr. Chairman.

Senator PROXMIRE. Are you with Philip Speser?

Father GEORGE. This is Jim Michaels, a student who has worked with me and Father Collins for 3 years. He is graduating next week.

Senator PROXMIRE. This young man with you is a student?

Father GEORGE. He is a student at Georgetown.

Senator PROXMIRE. What is your name, sir?

Mr. MICHAELS. My name is Jim Michaels.

Father GEORGE. He helped me draft this testimony. Father Collins taught me well. He made me learn to be brief.

SUPPORT FOR NSF BUDGET

I would like to talk to you about two topics: NSF and the United States planned space station. Within NSF, we would ask that this Committee at least support the administration's request, which is an increase and it would total about $1.67 billion.

As an example, Georgetown, for every NSF dollar we receive, we add another $8 dollars to it. We ask that the committee keep that increase that the administration has requested.

SPACE STATION

With regard to the space station, Georgetown, as you know, has a large international intercultural dimension to itself. The space station puts immense importance on the strategic and commercial value in the world that we live in. There is a real need for intercultural understanding of the international dimensions of life in space and the implications of keeping an international space program alive as we are working with various other countries as we do it.

The technical dimension seems to be well covered by NASA. We would ask that the committee encourage NASA to work cooperatively and to develop training and educational programs that would affect some diplomatic and fruitful commercial and scientific endeavors among the international partners in space.

Needless to say, Georgetown has a strong background in that area. We certainly want to be a participant in any focus that would deal with the international dimensions of space. But it is that humanistic liberal arts type of dimension that we believe is still necessary in space. If you are going to have people from various cultures living together, it is a very critical atmosphere out there. We would ask the committee to keep that and encourage NASA to keep that in its mind.

Thank you, Mr. Chairman.

Senator PROXMIRE. Thank you very much.

Mr. Michael, do you want to add anything?

Mr. MICHAEL. I just want to support Father George's statement that NASA should look to higher education as a resource for cooperation and development of space in the space station and not just technical engineering, though they are absolutely critical; but also to law schools, business schools, because if NASA and the United States want to build up the commercial possibilities of space, it has got to look to those resources in universities throughout this country and in other countries to work together.

Senator PROXMIRE. Thank you. Thank you very much.

[The statement follows:]

STATEMENT OF GEORGETOWN UNIVERSITY

NATIONAL SCIENCE FOUNDATION

Mr. Chairman and members of the Committee, I am Father T. Byron Collins, S.J., Assistant to the President of Georgetown University. I am accompanied by Mr. Samuel Harvey, also representing Georgetown. We would like to thank this committee for this opportunity to testify in support of FY 1988 funding of the National Science Foundation.

We applaud this committee for recognizing the critical importance of strong financial support for the NSF, which helps to keep the United States, especially through the work in its institutions of higher education, in the scientific forefront. We therefore urge the committee to accept the President's proposal of an increase in NSF funding to $1,673,000,000 from the FY 1987 level of $1,445,622,000.

We stand in agreement with the American Council on Education as we point to the vital role played by the National Science Foundation in ensuring the quality of education in the nation. The NSF makes important contributions, especially through its Science and Engineering Education Directorate, to precollege mathematics and science education, and effectively supports college science instrumentation and other essential undergraduate research and education activities. And through the fellowships and assistantships sponsored by the NSF the national needs are increasingly being met for highly skilled personnel, who make important contributions to the teaching and scholarly professions, and address serious shortages of graduate faculty which threaten the future vitality of scholarship, research, and training in many disciplines.

Georgetown University has competed for and been awarded several major grants for programs in various disciplines, totalling $1.6 million (see attached chart). These initial grants have inspired the University to contribute eight times this much from our own funds toward the same programs. We can therefore attest to the importance of the programs the National Science Foundation sponsors for making higher education across the United States more viable.

	P.I.	DEPART	DIRECT	INDIRECT	TOTAL	BEG. DATE	END. DATE
1	Neale, J	Biology	$34,000.00	$0.00	$34,000.00	05/15/86	04/30/88
2	Henderson, E	Biology	$38,788.00	$6,212.00	$45,000.00	05/01/86	11/30/87
3	Henderson, E	Biology	$10,733.00	$250.00	$10,983.00	11/01/85	04/30/87
4	Martire, D	Chemistry	$42,695.00	$0.00	$42,695.00	06/15/83	11/30/87
5	de Levie, R	Chemistry	$34,437.00	$15,484.00	$49,921.00	07/01/86	06/30/87
6	Martire, D	Chemistry	$93,317.00	$16,683.00	$110,000.00	06/15/83	11/30/87
7	Pope, M	Chemistry	$62,263.00	$17,737.00	$80,000.00	06/15/84	11/30/87
8	Guiochon, G	Chemistry	$129,940.00	$20,025.00	$149,965.00	03/01/86	08/31/87
9	Weiss, R	Chemistry	$94,550.00	$14,650.00	$109,200.00	04/01/86	09/30/87
10	de Levie, R	Chemistry	$44,025.00	$25,975.00	$70,000.00	07/01/86	06/30/88
11	Hernandez, D	Ctr. for Pop. Rsch.	$3,200.00	$1,770.00	$4,970.00	11/15/84	10/30/86
12	Hernandez, D	Demography	$25,000.00	$2,000.00	$27,000.00	11/01/86	01/31/88
13	Schwartz R	Graduate School	$17,100.00	$0.00	$17,100.00	06/01/85	05/31/90
14	Engler, H	Mathematics	$14,250.00	$8,408.00	$22,658.00	06/01/86	11/30/88
15	Neubrander, F	Mathematics	$13,080.00	$7,712.00	$20,792.00	06/01/86	11/30/88
16	Treado, P	Physics	$21,350.00	$650.00	$22,000.00	03/15/85	08/31/87
17	Treado, P	Physics	$18,932.00	$3,068.00	$22,000.00	03/15/85	08/31/87
18	Treado P	Physics	$9,667.00	$333.00	$10,000.00	07/01/85	12/31/85
19	Balzer/Feschbach	Russian Area Studies	$228,268.00	$68,481.00	$296,749.00	11/01/85	06/30/88
20	Braford, M	Anatomy	$32,705.00	$19,295.00	$52,000.00	08/01/85	01/31/87
	P.I.	DEPART	DIRECT	INDIRECT	TOTAL	REG. DATE	END. DATE
21	McCormick, C	Anatomy	$72,827.00	$32,173.00	$105,000.00	07/01/84	12/31/86
22	Chirikjian, J	Biochemistry	$60,455.00	$22,211.00	$82,666.00	04/01/86	09/30/87
23	MacGregor, C	Microbiology	$21,918.00	$10,082.00	$32,000.00	08/11/83	01/31/87
24	McGee, R	Pharmacology	$35,415.00	$19,585.00	$55,000.00	08/01/83	01/31/87
25	Zapolski, E	Physio. & Biophys.	$621.00	$0.00	$621.00	07/15/86	07/14/87
26	Kasbekar, D	Physiology & Biophysics	$30,648.00	$49,352.00	$140,000.00	08/15/86	01/31/89
			$1,250,184.00	$362,136.00	$1,612,320.00		

1961

TITLE

1 Acquisition of a Photomicroscope
2 Developmental Regulation and Functions of Protein-Linked Oligosaccharides in Dictyostilium Discoidium
3 U.S. - United Kingdom Cooperative Science: Molecular Coding
4 Basic Studies in Gas and Liquid Chromatography
5 An Experimental Study of Two-Dimensional Nucleation and Growth
6 Basic Studies in Gas and Liquid Chromatography
7 Coordination Chemistry at Surface Metal Sites of Heteropoly Oxometalates
8 Fundamental Studies in Non-Linear Chromatography
9 Influence of Solvent Anisotropy on the Rates and Specificities of Thermal and Photochemical Solute Reactions
10 An Experimental Study of Two Dimensional Nucleation and Growth
11 Old Data Made Research-Usable for the Study of Long Term Trends in the Family Circumstances of Children
12 Old Data Made Research Usable for the Study of Long Term Trends in the Family Circumstances of Children
13 Graduate Fellowship Award
14 Mathematical Sciences: Partial Integro-differential Equations with Singular Kernels
15 Mathematical Sciences: Integrated Semi-Groups and Their Applications to the

TITLE

Abstract Cauchy Problem
16 National Nuclear Physics Summer School
17 National Nuclear Summer School; Washington, D.C.
18 Atomic Collisions Conference
19 The Soviet Technostructure: Scientific/Technical Education in USSR
20 Vertebrate Telencephalic Organization
21 Central Projections of the Octavolateralis System
22 Biotechnology Workshop for Teachers
23 Assembly and Regulation of an Integral Membrane Protein
24 Adaption of Neural Nicotinic Acetylcholine Receptor
25 IPA-NSF
26 Apical Membrane Transformations of Gastric Parietal Cells

NASA SPACE STATION

Mr. Chairman and members of the Committee, I am Father T. Byron Collins, S.J., Assistant to the President of Georgetown University. I thank you and the members of this committee for the opportunity to testify.

I am testifying today, as I have in the past, as a representative of Georgetown University, which by its very nature and tradition has concerned itself with the international/intercultural aspects of human experience. We urge this committee to demonstrate a similar concern and commitment as it deliberates the nature and scope of the United States Space Program for the coming decades.

As currently planned, the United States Space Station, will incorporate the efforts of many partners from various nations--Japan, Canada, and Western European nations--with their various cultures. Given the immense strategic and commercial value of the exploitation of space which will come about because of the space station, negotiations and relations among the partner nations will be critical. Intercultural understanding will be essential for this important cooperative effort to be successful.

Since this project is an unprecedented human experiment in long-term intercultural coexistence and cooperation beyond the earth's atmosphere, it is a matter which transcends the scientific and engineering communities. Input from the authorities on the human experience in law, business, international relations, and liberal arts will be as important as the technical aspects for keeping the International Space Program aloft.

As presented in the written testimony of NASA to this committee, a high priority in the objectives of the agencies programs, especially in the Office of Commercial Programs, is to "establish close working relationships with the private sector and academia". Yet the agency seems to restrict these relationships to "institutions with strong research capabilities in sciences and engineering".

Therefore, we would like to urge this committee to keep the talents of all of the higher education community in mind as it directs NASA on its international programs. The United States is well endowed with universities with vigorous and respected programs in international relations, international law, and international business, as are Japan, Canada, and Western Europe. We would like to recommend that NASA be encouraged to investigate an international program in which these univeristies would work cooperatively to develop training and educational programs to effect the most diplomatic and fruitful commercial and scientific endeavors among the international partners in space. Georgetown, with its strong background in international affairs and diplomacy studies, and with programs in International Business Diplomacy and Science, Technology and International Affairs already in being, is willing to be a focus and participant in any training or development programs along these lines.

On behalf of our President, Rev. Timothy S. Healy, S.J., we thank you again for this opportunity to testify.

FUNDING FOR NASA

Senator Proxmire. I would like to ask a few questions. I will start with Mr. Hieatt. Mr. Krone might want to comment, too. All you gentlemen are in the same ballpark; maybe each of you would like to comment on this problem.

You all say we need more funding for NASA and for our space program, and we need a space station and so forth. You have the support of a very large and articulate proportion of the population, and you have strong support in the Congress.

You also, of course, are crashing right up against a situation where we have very strict restraints on the budget and the federal government is limited in what it can do.

Why shouldn't we establish this kind of a framework for the space program and challenge it to meet this demand? No. 1, any program which is primarily or largely military, let the Defense Department itself call for it in their budget. If they can't justify it, if there are other priorities that are higher, then it will just have to be postponed until they feel that it is of sufficient military importance to put it in their limited budget.

PRIVATE SECTOR FUNDING

Second, if it is primarily an industrial proposal, you talked about the importance of making our country more competitive, and I think that is a very persuasive argument. Why shouldn't we have industry pay for far more of it than they do? The fact is, as compared with some other countries, as compared to what we could do, we have the federal government fund these programs, and I think the best way to validate whether or not they have any real practical, industrial applications is whether or not industry is willing to come forward and put their money where their mouth is.

Of course, they want it if the federal government is going to give it to them as a gift. But it seems to me we ought to challenge the industry to come up with a substantial proportion of the cost themselves.

Finally, Carl Sagan and other very persuasive advocates of a vigorous space program argue that these are programs that help all mankind. Well, whenever I hear that, I always think, let all mankind pay for it. We are in a tough position here. What we do is we put so much into scientific research and scientific development. Then the Japanese and the Germans and others come along, and they apply what we have developed.

COOPERATION WITH OTHER NATIONS PROPOSED

Why shouldn't we have far more? We have done it with the solar-polar mission; we have done it with a few other programs; but why shouldn't we do this as a comprehensive, regular, systematic program of requiring that when we have these programs of going to other planets and so forth, that constantly, it always be done not just with the United States of America by itself, but in concert with other countries and, wherever possible, in concert with the Soviet Union?

After all, that is what Senator Matsunaga, whom you praise, is supporting, and I was the first cosponsor of that amendment. I would like to see the Soviet Union put some of their money into that program, too. It has no military implications. Nobody could sit up on Mars and fire missiles at us. They have got a very advanced program. They spent a lot of money on it. They have some fine scientists who helped their program. We cooperate.

Somebody had mentioned how important it is to have cooperation. God bless you. That is what we should have here. Why can't we have that kind of a program instead of the program, with the implications I get from your fine statements, that the federal government ought to come up with more money? Folks, it is not there. So why can't this kind of program I am suggesting now be more practical and fairer and be able to advance space science and space research and space travel much more quickly and efficiently?

Mr. Hieatt, why don't you start off?

Mr. HIEATT. You made several different points.

Senator PROXMIRE. I sure did.

SPACE STATION NATIONAL RESOURCE

Mr. HIEATT. First, the fact of industry funding the space station. The space station, I think, is viewed by all of us as really a national resource. It is not unlike the wind tunnels.

I think we brought this analogy up before, where the government invested in the capital which one single industry could not put up, and then as a cooperative effort over the years, that is what has led the United States and kept the United States a leader.

Except I agree with Norris; we are falling behind, but are ahead of the record in the avionics industry. That has helped jobs; that has provided funding, which has supported other programs. It has been one of the few things we are ahead in the balance of trades on.

I think most of us, in looking at the space station, view this as an investment by the country to put us in a position where we can reap economic gain in the future. I don't think you can say today what the commercial applications will be.

Anybody that goes forward and sells the space station as a commercial venture, I don't think, has thought the problem through. But we do need that kind of a resource in order for ourselves to get to the place where the Russians are.

Senator PROXMIRE. Why shouldn't it be incremental, though? Why do we have to go the whole way? Why do we have to spend so much in an area where you say we can't really date it; we can't say whether it is going to work or not; we can't tell where it is going to go? The people who can tell us that are the practical hard-headed people who put up money in industry for these types of programs.

Mr. HIEATT. I am at least having a problem, because there is no basic research that has ever been done where you could say what the result would be. If you go back to the invention of the vacuum pump, when the guy invented the vacuum pump, it was a neat toy, and he invented it. That was the beginning of the electronics revolution. That is where vacuum tubes and all of that came from, a vacuum pump, and when he invented it, he didn't know what it was for. I think this is that kind of an investment.

INCREMENTAL APPROACH

Senator PROXMIRE. The real problem, though, is we don't know how the space station is going to be used. For that reason, it seems to me we should have a more incremental approach; learn as we go along. There is no rush. Space is going to be here for a long, long time. To the extent it has military implications, that is one thing. But I just don't see it.

We are not in industrial competition with the Soviet Union. Who else is putting up a space station? If they are, let's join them.

Mr. HIEATT. We are trying to join Europe and Japan. Both of those countries have plans to have their own space station. They are using our space station as an initial jumping off spot, if you examine their programs. The increments they provide will ultimately be capable of being independent and being their own facility.

Let me get to cooperation, because I agree that our programs should be cooperative. I would like to see them be cooperative with the Russians. I think that does a lot for us in all kinds of ways, but in order to form a cooperative program with anybody, you have to have something to offer.

The Russians are ahead of us right now. Unless we do something to develop our technology where they gain as well as we gain, they won't form a cooperative program.

Senator PROXMIRE. It doesn't bother me that the Russians are ahead of us, unless they are ahead of us in military. What difference does it make? Do we have to be No. 1 in everything? It just doesn't make any sense to say that we have to move ahead because we have got to be No. 1 all the time.

I love this country as much as you do, but I don't think that when somebody says the Russians are ahead of us, therefore we have got to put a lot of money in this area. That doesn't impress me. I think we are so far ahead of the Russians overall in our technology, in our productivity, in our economy that we don't really have much to worry about as far as the Soviet Union is concerned. Maybe we do with Japan, but not the Soviet Union.

Yes, sir?

Mr. KRONE. My comment relative to this discussion is directed at the aeronautics side again, and not necessarily the space side of the NASA budget.

DEFENSE AERONAUTICS R&D

My thoughts on that matter are that in aeronautics now, and I am very specifically talking about aircraft, commercial aircraft, specifically, with some lesser degree to military aircraft, in answering the question relative to why doesn't the military do it. The military does do it, and there is a very strong R&D program in the DOD in aeronautics, obviously.

There are very strong forces in the DOD that drive towards mission-oriented R&D efforts. For example, advanced supersonic transport-type developments and type technology. Exploration is not necessarily very high. There are overlaps, but there are elements that aren't very high on the list.

Second, relative to cooperation, there is great cooperation. I think our R&D programs, for example, are doing an awful lot in aeronautics.

The point is, I guess, that we are falling behind relative to our competitive position in the commercial world, in commercial sales.

In other words, the balance of trade in aeronautical products is basically aircraft; it is basically aircraft. The $10.9 billion that I mentioned is eroding.

The current situation with the support from the military for aeronautics and commercial aeronautics or the overlap that is there and the R&D by the industry is not producing an effect that is keeping up to the level that we, in the past, have enjoyed.

What we are saying is that we need to increase the NASA aeronautics program in order to maintain that level of sales which produces taxes for all other kinds of programs, of course.

Senator PROXMIRE. Thank you, Mr. Krone.

Mr. Flajser?

Mr. FLAJSER. Well, Mr. Chairman, I think the point of cooperation is that you share costs as well as you learn from each other. I think if you want to use the space station as an example, there is a sharing of costs with the European Community; the Japanese; the Canadians, at least a proposed sharing, if we can work out our joint agreements.

COOPERATION IN SCIENCE CRITICAL

Cooperation in the area of science is critical. There are a number of international joint missions. I think they are both cost effective, because we share costs, as well as education effective. But there are certain areas where you don't necessarily want to cooperate because you may be working in proprietary, the important areas, such as materials processing, such as in telecommunications, and there, it may be appropriate to have, if you will, unilateral ventures on the part of the United States.

The concern that we have is if you take——

Senator PROXMIRE. Let me interrupt to say that the kind of sharing we have on the space station with the Europeans is certainly not what I had in mind. There, we do most of the work; spend most of the money. They had modules.

I am thinking of a situation where we provide perhaps 20 percent or so of the cost and other countries provide 80 percent. We provide more than any other country, but not everything, kind of the same relative support we gave the United Nations. Why not? They have the funding. They are going to gain from it.

Mr. FLAJSER. They are certainly going to gain from it. In terms of their national resources, on country-by-country resources, their budgets are, at least in order of magnitude, smaller than our budget.

Senator **Proxmire**. I say ours should be the biggest of them all. For us to provide the overwhelming proportion of the cost of a program that is going to benefit these countries to such an extent we can't afford, we are running the biggest deficit in the world by far on every basis.

BALANCE IN FUNDING/BENEFITS

Mr. **Flajser**. That is clear. There is somewhat a question of control. If you spend more money on it, you perhaps have greater control over it. But I have to underscore what you just said. If we provide 80 percent of the cost and they get 80 percent of the benefit, I don't think that is a fair deal, either.

Senator **Proxmire**. We are on the same track. You have got it.

Mr. **Flajser**. I understand that is where you are coming from; I couldn't agree with you more. If they are getting all the value added and we are providing all the investment, I don't think that is in our national interest. I think that ties into the question of balance.

We have to provide, in addition to the hardware and the infrastructure, which is just the cost, the types of experiments, the types of industrial research as well as basic research that would be in our national interest, and if we shortchange that part of it, then I think you will have a scenario where we put in the majority of the funding and they get the majority of the benefits.

I think there are wise heads around that perceive that, and that is a key concern.

Senator **Proxmire**. I am not sure we agree, but we are much closer than I thought we might be.

Father George or Mr. Michael?

Father **George**. Mr. Chairman, just from listening to the discussion, I think you can use some graduates of our joint master and law degree.

Senator **Proxmire**. I certainly agree. My son is graduating from Georgetown Law School this month, I am proud and happy to say. It is a great school.

Mr. Michael, do you want to make any remarks?

Mr. **Michael**. No; I agree with Father George.

Senator **Proxmire**. Thank you very much, and ma'am. I want to apologize if I seemed a little bit contentious. I thought maybe that was the best way to bring out what we can up here. Thank you very much.

[The statement of Robert W. Hager, vice president (space station), Boeing Aerospace Co., follows:]

STATEMENT OF ROBERT W. HAGER, VICE PRESIDENT SPACE STATION, BOEING AEROSPACE CO.

AMERICAN NEEDS THE SPACE STATION

The Space Station continues a time-tested tradition of government investment in national facilities that create new knowledge and generate economic benefits. NASA's commitment to the Space Station follows U.S. Government leadership in developing the nation's merchant marine, ship canals, railroads, highways, fisheries, aviation, computers, and communications satellites. The success of these industries was a direct result of Government support. The benefit was the creation of revenue-producing commercial sectors of our society. These public investments have been repaid many thousands of times.

NASA's Space Station Program will enable new space research in several fields. Modest instruments operating in orbit for long periods of time at low cost will open new opportunities in high-energy astrophysics and space plasma physics. Routine and, if needed, frequent manned and telerobotics servicing of scientific space vehicles like the Hubble Space Telescope will increase their science return. A large instrument platform in polar orbit will enable accelerated research on earth's climate and environment, for better understanding of long-term trends and of the global effects of human activities.

The history of industrial development is significantly a history of materials technology. Our ability to devise new inventions depends on our ability to create materials with enabling properties--witness the dependence of aerospace vehicles on high-strength, lightweight structural materials and the emergence of an entire, huge industry built on the special properties of semiconductors. The Space Station will also place permanent and well-equipped laboratory facilities in orbit for research in life sciences and materials and processes. Life sciences and space medicine research have greatly benefitted medical science through better understanding of biological processes and especially through technology advancements that facilitated many new noninvasive diagnostic and imaging techniques.

As is always true with any significant advancement in research opportunities and facilities, the most important discoveries are sure to be the ones we have not yet imagined. The scientific and economic returns from them cannot be estimated. But with the projected investment cost for the Space Station about equal to one month's U.S. balance of trade deficit, it is hard to conceive that the station will not be a very sound investment.

The Space Station is important to international cooperation in space. Plans for Canadian, European, and Japanese cooperation in the Space Station program are well known. Less known are the facts that the Soviet space station program provides an attractive alternative to scientists of other nations for flight opportunities and that significant Western European scientifc instruments are now flying on the Kvant module recently joined with the MIR space station. Those concerned over technology transfer through international cooperation in the U.S. station should be more concerned over the technology transfer that will occur if our European and Japanese allies find it to their benefit to cooperate more closely with the Soviet program.

Europe has followed a strategy of materials processing promotion to its nonaerospace community in conjunction with development of processing hardware by aerospace. Within Europe, the near-term experiment environment is generally seen as the Spacelab module. The Intospace consortium has been formed to promote and develop materials processing in space throughout European industry. At least four more Spacelab flights are currently planned by Europe, particularly by West Germany. Japan also has similar plans to focus its efforts on the Spacelab modules, beginning with the Spacelab-J flight in 1988. (These flights are not all manifested.) The Japanese Society for the Study of Commercial Use of Space Station has 87 participating members from major Japanese companies. Both Europe and Japan have built facility-class equipment for materials processing in Spacelab and have performed numerous sounding rocket experiments dedicated to microgravity materials processing. The present European/Japanese development strategy centers on cooperation with the U.S. Space Station Program, but there is every indication that without adequate commitment and progress on our part, our allies will forge ahead without us.

Some space science fields will not directly benefit from the Space Station program. Practitioners in these fields have of course, been vocally critical of the program. The Space Station will not, for example, benefit planetary exploration, at least not until automated or manned exploration missions grow large enough to need a spaceport in orbit to launch them on their way. While these criticisms have some validity, they are not central.

The real importance of the Space Station is in new opportunities. Encouragement of space commercialization is a basic tenet of current U.S. space policy. Clearly, success in commercializing materials processing space would deliver economic benefits--jobs, new technology, profits, and economic growth. But because commercialization requires the voluntary participation of investors, policy is not enough. The investment must be an attractive deal. Many investors have voted with their portfolios that space processing isn't. Why?

To begin with, the total microgravity research time accumulated in the West to date is small. Few exploratory experiments were performed on Apollo, Skylab, and Apollo-Soyuz. Subsequently, there have been about 1,000 experiments in drop towers and drop tubes, about 4 seconds of microgravity each; 50 to 60 aircraft missions (the quality of microgravity on aircraft flights is poor), about 400 seconds each; 80 sounding rocket flights,

about 5 minutes each, with very small experiment volumes. Finally, shuttle and spacelab materials processing experiments have logged about 100 days of useful experiment time in orbit. (The Soviet space stations have logged many hundreds of days of materials processing research and are reported to be producing useful electronic materials.)

The rate of advancement in materials processing in space is extremely limited by the lack of routine access to the microgravity environment. Flight opportunities are infrequent and short. There is a severe shortfall in availability of useful experimental equipment. NASA and industry are beginning to increase the inventory of useful materials processing equipment by developing crystal growth facilities, containerless processing facilities, furnaces for metals and alloys processing, and electrokinetic separation equipment.

Despite the problems, commercially funded research has begun in the United States. Particle Technologies has produced latex spheres of extremely uniform size in the Marshall Space Flight Center's Monodisperse Latex Reactor, flying on the shuttle. They are sold commercially as calibration standards. McDonnell Douglas Astronautics Company has operated a continuous flow electropheresis facility on seven shuttle flights. Boeing is developing a vapor crystal growth research furnace to fly in the shuttle mid-deck.

Many companies are investing modest research funds in materials processing in space. Those we can identify that are now or recently have been spending research funds are as follows:

Abex Corp.
Alcoa
Amoco
Armco
AT&T
Barnes Engineering
Battelle
Boeing
Burroughs-Wellcome
Cabot
Celaneso
Deere & Company
Dow Chemical
DuPont
Eastman-Kodak
EG&G
Electron-Optek
Engelhard
GE
General Motors
Grumman
GTE
Hercules, Inc
International Space Corporation
Lockheed

Martin-Marietta
McDonnell-Douglas
Merck
Microgravity Research Associates
Perkin-Elmer
Phillips Petroleum
PPO
Quantum Technologies
Rockwell International
Rohm & Haas
Santa Barbara Research Center
Schering
Smith, Kline & French
Spectron
Teledyne
Upjohn
Westinghouse
Wheeler Development
Wyle
3M

These are just the corporations; in addition, several government labs and many universities are involved.

This new technology area is following the classical historical trend of new commercial technologies exponential growth. In the last few years, the doubling time exhibited by the number of new companies entering this field has been about one year!

These users hope to use the shuttle mid-deck, Getaway Special containers, special payload carriers in the shuttle payload bay, and the Spacelab for microgravity investigations. Our estimates are that the shuttle and Spacelab will, at best, be manifested to serve only about 10% of the aspiring user community. Even if microgravity researchers could fly on every planned shuttle flight, access to the microgravity environment is still about an order of magnitude short of what is needed to enable significant commercialization.

It is expecting too much to wish for great enthusiasm from the investment community so early in this new science. Key research is being done, albeit slowly. So far, only one space-produced product has been introduced to the market place, the rest are in early stages of research. Nonetheless, it is not too early to look to the future, to inquire what conditions are needed to attract significant capital investment.

Investors are willing to take "long shots." During the ascendancy of seapower, traders gambled on obtaining shiploads of spices from the Orient. There was great risk that one's ship would never be seen again--but if one's ship did come in, one's fortune was made. Investors today accept big risks when returns upon success are great. Investments are modest, usually no more than a few million dollars. Such amounts are now being invested in space materials processing. With few exceptions, the investors are seeking to obtain a position in intellecutal property rights with the expectation that in the future, those rights will have great value as keys to success in new materials processing technology on Earth or in space.

What we do not see today are investments, or even preliminary planning for them, on a scale commensurate with creation of a significant new industry. Why? Because the risks are too great.

The first risk is technical: will a proposed process yield a successful product? The second is market: given a processing success, can we sell the stuff at a profit? The third is access: how will we get access to the space micro-g environment to make enough of the product to obtain a return on our investment? Access risk also exacerbates the first two risks, increasing the danger of a venture being overtaken by an Earth-based development.

Access to space is not assured-it wasn't even before the Challenger tragedy. Access, when available, is very costly. There are no facilities in space to support a laboratory or a production facility and NASA plans for the Space Station are subject to the whims of the government's budgeting process. A strong national commitment for a space station needs to be perceived in the investment community. The timing for an operations space station, available for industrial R&D, needs to be within the planning horizon for investment.

We may contrast today's situation with a hypothetical future including a maturing space processing industry:

"Several automated factories are now in operation above the bothersome drag environment of lower orbits yet readily accessible by space tug (an outgrowth of the present OMV). Each factory is serviced once a week, on the average, to harvest product, replenish feedstock, and accomplish maintenance. The servicing is normally done by intelligent robots but, occasionally, a human goes along to assist.

"Manufacturers are struggling to increase capacity to meet fast-growing market demand. Competition among the three air/space lines offering daily passenger and freight service to orbit has driven transport costs down dramatially. Products once thought hopelessly uneconomic for space manufacture are earning handsome profits. Many companies, new and old, are vying for the limited R&D facilities of the space stations. New facilities are under construction but many of them are already booked. Some industry analysts warn of a shakeout ahead."

Sound familiar? It should. Except for the novelty of its location in space, the description is typical of a new fast-growing industrial sector - declining costs, rapid expansion, growing markets, jobs, and profits.

New economic sectors are one of the main engines of economic growth and clearly to be sought after as a matter of national policy. In today's world, especially in the United States and other countries that conduct R&D on the frontiers of technology, publicly funded R&D is often the wellspring of the technology that drives new economic sectors. Military developments of microcircuits enables commercial digital microelectronics. The U.S. Government created the space communications industry.

So we are faced with that old familiar question: in view of all this, what makes sense?

Clearly, the most urgent need is for adequate research facilities and continuity of research programs. Corporate commitments to long term expenditures in materials processing in space require a permanent facility in space with the resources needed for exploration of concepts and the building and operation of industrially sponsored manufacturing facilities. The evident answer is Space Station. The Space Station must offer adequate research facilities and continuity of research programs. This means adequate lab space, power, crew time, equipment, and operating flexibility. The need to expeditiously complete a development and get a product on the market cannot be overemphasized. The present inability to make rapid research progress is probably the single most important impediment to commercialization of materials processing in space.

The Space Station will remain on orbit continuously with the resources needed to perform extensive materials research and development. This will enhance the fundamental research base through a wide variety of scientific activities. Experiments are planned in such areas as fundamental fluid dynamics and transport phenomena; combustion sciences; basic heat and mass transport phenomena in fluid media; containerless processing; crystal growth by a number of processes, including vapor transport, supersaturation and cooling, directional solidification, and float-zone refining; formation of metallic alloys; critical-point phenomena, and cloud-formation microphysics. These research areas require, as does all empirical science, accumulation of statistically significant data which that only be generated by a large number of experimental runs. The Space Station offers the first opportunity to remain in orbit long enough to perform this kind of investigative research.

The Space Station dedicates one entire module to the U.S. laboratory. The U.S. laboratory is about twice the size of Spacelab. In orbit continuously, it represents even by this measure alone, a hundredfold increase in research capacity over that available today. If one imagines it desirable to offer the equivalent space of one experiment bay for three months out of each year to each institution (government or academic

entity, company, etc.) now investing in research on space materials processing, the U.S. Laboratory is just about the right size. The lab will have about 20 kilowatts of electrical power for users during early operations. This is several times that available (to users) in Spacelab. As payloads mature, some single experiments will need 15 kilowatts or more, and the Space Station will increase its power capacity for lab users to about 50 kilowatts.

Thus the Space Station will be a highly productive environment for creation of the research and technology base needed to commercialize microgravity materials processing. It will support process scaleup and pilot production demonstrations. Compared to shuttle-borne facilities, the Space Station offers order-of-magnitude or better cut reductions simply by virtue of its permanent presence in space. By the same virtue, it will permit customers to complete their research and development programs in a timeframe of interest to investors.

The Space Station's research accommodations, together with its development of the research data base, will give the commercial sector the key tools to make investment decisions. This will enable rapid progress, beginning with basic scientific research, through technology development and scaleup, to commercial pilot and prototype production, and eventually to full commercial materials production.

The space shuttle for transport, the Space Station for research and development, and commercially funded free-flyers for production; this combination represents an economically viable infrastructure for launching a space processing industry. A typical production platform, placed in orbit at about $16,000 per pound (including delivery and hardware cost), would have product throughout equal to its own mass in one year. A net transport cost for product of $5,000 per pound, plus amortization, yields a product cost of about $10,000 per pound. The sales price must be about three times this to cover other costs plus profits. Two products often mentioned as candidates for early development of the industry are supercomputer chips and ethical drugs. After losses are figured in, $90,000 per pound converts to about $6,000 per 10-cm wafer, $150 per chip. Finished chips would sell for thousands of dollars. $30,000 per pound converts to about $70 per 1-gram dose of an ethical-drug--certainly a supportable price.

Economic models for space materials processing, while speculative, offer tantalizing prospects. At shuttle transport costs, the aggregate demand for space-manufactured products could be on the order of one or two shuttle payloads per year; this is, less than 100,000 per pound, assuming adequate permanent facilities in space. The market would be highly sensitive to cost, exhibiting a tenfold increase in annual sales value and a hundredfold increase in quantity of product, given a tenfold reduction in trasport costs. What this tells us is that future reductions in space transportation costs, as

a result of new developments in launch vehicles, could have great leverage in stimulating this industry. A number of investigators have projected that a next-generation system might achieve an order-of-magnitude reduction in earth-to-orbit transportation costs. A few more daring predictions have suggested an eventual possibility of two orders of magnitude.

The Space Station is the cornerstone, the sinc qua non, of this expotential new industry. Low-cost space transportation then becomes a key to its emergence of a new industrial economic sector. The R&D priorities are clear; a space station as a working, practical, productive R&D laboratory for materials research and development; and space transportation systems that offer frequent, routine, low-cost round-trip service to Earth's orbit. The payoff could be space commercialization that will dwarf all but the largest earthbound industries.

STATEMENT OF PHILIP SPESER, EXECUTIVE DIRECTOR, NATIONAL COALITION FOR SCIENCE AND TECHNOLOGY

Senator PROXMIRE. Our financial witnesses are Mr. Speser; Dr. Leone; William Yolton; Mr. Feldman; Mr. Bryson and Ronald Wood. I guess it should be Dr. Speser.

Dr. SPESER. It doesn't really matter.

Senator PROXMIRE. Is it Doctor?

Dr. SPESER. It is Doctor, but I don't stand on the formality.

Senator PROXMIRE. You have earned your doctorate. By gosh, you ought to be recognized as such.

Dr. SPESER. It makes my mother happy.

Senator PROXMIRE. You are testifying on behalf of the National Coalition for Science and Technology.

Dr. SPESER. Thank you very much, Senator. I will be very brief. I understand the written comments will be entered in the record.

Senator PROXMIRE. They will be in full.

Dr. SPESER. I represent over 30,000 scientists in our member associations as well as our individual members' associations through the National Coalition of Science and Technology.

Quite briefly, Senator, I am sure you have heard about all the competitiveness justifications for funding NASA and NSF at the levels proposed by the administration, so I will not rehash that ground unless you desire to go over it.

Basically, we are a group of scientists and engineers where most of our lives we have been doing science and engineering, and whether you fund NSF and NASA at the administration's levels or not, we are going to keep on trying to do science and engineering. That is the reality of it. Nobody goes into science and engineering in the United States to get wealthy. Nobody goes into it for high status, unlike in Germany, the Soviet Union, or Japan.

One of the things that we are proud of is because of the work we have done, we live in a country today that has the technological capability to feed every citizen, to provide adequate housing and clothing for every citizen, and to provide them all with access to decent medical care. This is something that we should all be aware of, because it is unique in human history that we have been able to do this.

NATIONAL PROBLEMS

Nonetheless, this technology is not perfect. We have a number of problems. We waste phenomenal amounts of energy simply distributing electricity; we pollute our environment; we have needs to reorganize our workplaces to allow for better innovation and creativity; and as scientists and engineers, we intend to work on these kinds of problems as well as other problems involved with the expansion of knowledge.

The reality is that if there is no money to do this, our efforts will be hampered. This is something that is for this committee to decide whether you want to address these problems and to what extent. For us, the fact of the matter is that money is needed to buy equipment, build facilities, buy supplies, and pay salaries. Money is needed to support students, so that the democracy of inquiry is not subverted by the poverty of those who want to learn.

SCIENTIFIC RESEARCH EXTOLLED

There is a unique joy and excitement that comes from chasing an idea from inception into research through solid results. When you know the people of this planet can use your research to meet their needs, this joy and excitement is transferred into the joy Beethoven must have known when he composed the Ninth Symphony.

To some perhaps this sounds hokey, but that is what drives science and engineering; it is what brings me before you today to ask for full funding for NSF and NASA. We can only use the things on our country's behalf if you, the elected representatives, want us to.

We can do science and engineering; we can educate our neighbors' and our fellow citizens' children, or we can spend most of our time wandering around up here, going door-to-door in the corporate world and in our communities trying to raise the money needed to do science, engineering and education.

That is basically why I am here, sir.

Senator PROXMIRE. Thank you very much, sir.

[The statement follows:]

STATEMENT OF PHILIP SPESER, J.D., PH.D., EXECUTIVE DIRECTOR, NATIONAL COALITION FOR SCIENCE AND TECHNOLOGY

Mr. Chairman, members of the Committee, over the past weeks you have heard from leaders of corporations, universities, and professional societies. You have heard about the crisis in U.S. economic competitiveness and why fundamental science and engineering can make a difference. You have heard about the importance of a vigorous space program and why science and engineering is essential for this effort.

NCST strongly supports the Administration's budget requests for NSF and NASA. We believe that competitiveness, and the need for a presence in space justify those budgets. But that is, in the final analysis, not why we are testifying today.

We are scientists and engineers. For most of our adult lives we have studied, experimented, taught, and pushed back the frontiers of knowledge. We have heard people in Congress applaud us for this effort and we have, on occasion, heard people ridicule us for it. But throughout it all, we have seen our efforts contribute to a better world.

Today, we live in a country which has the technological ability to feed every citizen. We have the ability to provide adequate housing and clothing for every citizen and to provide access for all to decent medical care. Today, for the first time in human history, we have the technological ability to build a society capable of addressing basic human needs and of meeting those needs.

Unfortunately, the technology which enables us to do this is not perfect. We waste phenomenal amounts of energy simply distributing electricity. Superconductive materials should help us address that problem. We pollute our environment through chemical and other waste by-products of our manufacturing processes. Biotechnology should help us address that problem. We organize work in manners which inhibit the creativity and innovation of our people. Social science should help us address that problem.

As scientists and engineers we are proud of what we have accomplished. Now we find ourselves at a hard decision. Do we applaud our accomplishments and rest or do we continue working. Do we continue to push the frontiers of knowledge and the state of technology so that all of our citizens better benefit from our progress? Do we continue to push so that America's ability to feed, house, and clothe its citizens becomes America's ability to help all countrys feed, house, and clothe their people?

For scientists and engineers these really are not questions. Those of us who have proudly pursued knowledge and its applications in the past will continue to try to do so in the future. If the budgets are not there we will do our best. After all, it is not a secret that in this country, unlike the Soviet Union, Germany, or Japan you do not go into science and engineering if your goal in life is to be rich or join the highest status groups in society.

But recognize, as in any field, the progress of science and engineering depends in part on money. Money is needed to buy equipment, build facilities, buy supplies, and pay salaries. Money is needed to support students so that the democracy of inquiry is not subverted by the poverty of those who want to learn.

There is a unique joy and excitement that comes from chasing an idea from conception through research and into solid results. When you know that the people of this planet can use your research to meet their needs, this joy and excitement is transformed into the kind of ecstasy that Beethoven must have known when he composed the Ninth Symphony.

To some, perhaps this sounds hokey. But it is what drives us to pursue science and engineering. And it is what brings me before you today to ask you to provide full funding for NSF and NASA. Because the fundamental reality is that we can use effectively our talents on our country's behalf only if you, as elected representatives, want us to. We can do science and engineering. We can educate our neighbors' and fellow citizens' children. Or we can spend most of our time wandering around up here and going door to door in the corporate world and in our communities trying to raise the money needed to do science, engineering, and education.

As scientists and engineers we have a professional responsibility to build America's future. Please help by appropriating $1.893 billion for NSF and $9.481 billion for NASA.

NCST is a non-profit organization comprised of individual scientists and engineers, of universities and corporations within which we work, and of professional societies within which we exchange ideas. This testimony may not represent the views of specific individuals or institutional members or advisors.

NATIONAL SCIENCE FOUNDATION

STATEMENT OF DR. MARK LEONE, SOCIETY FOR AMERICAN ARCHEOLOGY

ANTHROPOLOGY PROGRAM

Senator PROXMIRE. Dr. Leone for the Society for American Archeology.

Mr. LEONE. Thank you, Senator Proxmire.

I represent the Society for American Archeology today, and the society is the largest group of professional archeologists in the country. The sort of archeology we do is anthropology; we are anthropologists as opposed to classic archeologists. I am an archeologist and dean of the department of anthropology at the University of Maryland.

We are here to support the anthropology program at the National Science Foundation and request that you support their request or the Foundation's request for full funding for anthropology.

There are a number of programs within the anthropology section of NSF, including a program to support archeology and one to support cultural anthropology. We believe firmly in both of them.

The strongest argument we can make beyond the obvious importance of research into the past of the new world as well as the old, which is supported through the Foundation, is the practical utility that comes out of this research on occasion.

NSF PROJECTS IN MIDDLE AMERICA

Just to give you an example that we are familiar with and have a lot of faith in, there are a number of NSF proposals, a number of NSF projects in the past in Middle America, what is sometimes called Mezzo America, which address the problem of why the tropical rain forests support such low populations now, or in prehistoric times or before Colombians they supported very large populations.

We have been able to concentrate on a population which had hundreds of raised fields. These are fields that are essentially in areas where very, very low population is supported today, but these particular devices, which are large rows of dirt, were immensely productive for the Maya and several other groups.

We are just beginning to understand the soil dynamics, the water dynamics, the crops, and the nutritional content that supported a population many, many times higher than is the case now.

We all know the political instability of this area, and we all know that there are serious problems of land reform, but here is a technological device which, if properly understood, could contribute to a firmer understanding of how the social instability of this area could be addressed. This is a practical consequence.

There are several others, especially with regard to Peru, where, for example, prehistoric terrorists supported much larger populations than they do now. Should we understand how these things actually work? Would it be possible to support a much larger population in these areas and produce, should these things be put back into operation, a much more stable situation?

So we think that out of archeology and out of the attendant understanding of social organization and social structure and cultural anthropology that there is a very direct, if long-term, payoff for the support of many of the proposals that are submitted to the anthropology program. Thank you very much.

Senator Proxmire. Thank you very much, Dr. Leone.

[The statement follows:]

STATEMENT OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY

Mr. Chairman, members of the Committee, we are here today to support the budget request of the National Science Foundation.

Archaeology at the NSF is funded through the anthropology program in the Behavioral and Neural Sciences Division. The Administration requested an increase of 18 percent for NSF's fiscal 1988 research programs, including a modest increase of $640,000 for anthropology, or slightly more than eight percent over the amount in appropriated for fiscal 1987.

We in the field of archaeology recognize that this is the year of "economic competitiveness" at the National Science Foundation. Like our colleagues in other scientific fields, we have thought about what to put on our list of contributions to American industry. We could mention the contributions to medical science, such as obsidian surgical blades; to environmental technology, such as radio carbon dating and baseline data on soil erosion: and to forensic technology, such as the identification of injuries to human skeletal material.

As important and unique as these contributions are, we do not believe that the value of archaeological research should be measured in this way. The purpose of archaeology is not primarily to stimulate competitiveness, nor do we believe that is the main reason the federal government should support archaeological research. We welcome such spin-offs. But the importance of archaeology is that it is key to our understanding of human history and prehistory. Indeed, the American people and this Congress have stressed the importance of studying our heritage by enacting laws to protect archaeological resources located on federal lands or impacted by federal undertakings -- and by supporting fundamental archaeological research through the National Science Foundation.

We are here today to support the NSF budget request for fiscal 1988, including $8.220,000 for the anthropology program. We would, of course, like to see additional sums added to support work in archaeology. In the past decade, the cultural resource programs of federal land managing agencies have provided us with a remarkable database. We have been urging NSF to institute a multi-year program in regional integration studies to enable archaeologists to test new theories about history and pre-history against this data. We would appreciate your mentioning this effort favorably in your report. Thank you for the opportunity to testify today.

SELECTIVE SERVICE SYSTEM

STATEMENT OF WILLIAM YOLTON, NATIONAL INTERRELIGIOUS SERVICE BOARD FOR CONSCIENTIOUS OBJECTORS

Senator PROXMIRE. Our next witness is William Yolton, National Interreligious Service Board for Conscientious Objectors.

Mr. YOLTON. Thank you, Senator Proxmire. I represent the organization that represents the vast majority of religious bodies in the United States, particularly on the questions of conscientious objectors and on the operation of our conscription system.

Last year, this committee concurred in the action of the House Subcommittee on HUD-Independent Agencies to declare certain regulations of the Selective Service System null and void. I want to bring you up to date on what happened.

The report of that subcommittee characterized both the product and the process of the collective service rulemaking as lacking in good faith and said these regulations compromise fundamental rights of conscience and impose unjustifiable hardship on men seeking exemptions, deferments and alternative service.

CONSCIENTIOUS OBJECTOR RIGHTS OVERRIDEN

Selective Service has changed classification procedures; removed from the local board statute authority to hear and decide all claims; limited application rights; closed board hearings to the public; limited information in assistance to residence; barred religious persons and CO's seeking alternative placements; placed unique burdens on CO's, and now has taken away the independence of the National Appeal Board.

Selective Service did this in a way that showed lack of good faith in putting out the regulations at a time and schedule when people would not be able to respond.

Four years of presentations to Selective Service, including a 1983 legal memorandum detailing why the churches are not agents of the government and why the will of Congress should be sustained in allowing CO's to work with the Mennonite Central Committee, has produced no meaningful response from Selective Service.

The Selective Service System never responded to our inquiries, nor to that memorandum. Instead, Selective Service issued regulations 2 years later barring Mennonite programs; barring the Church of the Brethren; Roman Catholic, and perhaps many other placements with long historically acceptable alternative service employers.

Selective Service takes the position that the religious employer of CO's may not do what Selective Service may do. It is a ludicrous interpretation of church and state relationships which, if pressed, would bar churches from worshipping or operating in hospitals, since Selective Service people want that.

REGULATIONS DECLARED NULL AND VOID

Last year, the day after our affected agencies testified to Congress, Selective Service sent to the Federal Register the full set of regulations unchanged. These regulations were then declared null and void by the House Subcommittee in July 1986. You concurred.

To this day, Selective Service has not notified the public through the Federal Register of that nullification. It has been pointed out to Selective Service that large gaps appear in the Federal Regulations because there has been no such issuance of notice.

Incredibly, Selective Service has this year gone ahead, and at the end of March, reissued the same regulations in part with the same frivilous explanations. In so doing, it appears to be the only federal agency with regulatory authority that thinks it does not have to publish in the Federal Register the status of its regulation.

Senator PROXMIRE. Mr. Yolton, could you summarize?

Mr. YOLTON. I have one sentence—nor give reasons for response to comments and can pretend that nonexistent regulations are enforced.

You have our full testimony with the suggestions as to what actions we would like to have, and I would add that I concur in the testimony of Attorney James Feldman for the Central Committee for Conscientious Objectors.

[The statement follows:]

STATEMENT OF L. WILLIAM YOLTON, EXECUTIVE DIRECTOR, NATIONAL INTERRELIGIOUS SERVICE BOARD FOR CONSCIENTIOUS OBJECTORS

Suggested oversight committee actions

A. The oversight committees of the Senate and the House should review the changes in Selective Service System regulations with the comments submitted to Selective Service in hand to determine whether or not the statute, Congressional intent, and case law are being complied with. The Registrants Information and Management System should also be compared for consistency with the law. The investigation should give special attention to whether or not fairness in administration, civilian control, and unbiased treatment of conscientious objectors are being maintained.

B. If Selective Service has reissued regulations revoked by Congress, without amending to accommodate the objections, they should again be declared "null and void."

C. If investigation reveals that Selective Service failed to give notice in the Federal Register of the revocation of regulations legislated by Congress in 1986, the agency should be required to comply with the requirements of the Federal Register leading to proper compilation of the regulations in the Code of Federal Regulations.

D. If investigation reveals that Selective Service has restricted access to its information improperly in the case of NISBCO (or others), refusing to meet with it and its officers, limiting its access to information materials, requiring improper fees for copies under FOIA requests, and seeking to impair its reputation with SSS personnel and restricting their right to communicate with NISBCO staff, SSS should be directed to return to the proper standard of conduct by government officials.

E. If a pattern of control by the Department of Defense through personnel and/or system designs, direct or indirect, can be established, the Selective Service System should be restored to full civilian direction, especially in the administration of alternative service for conscientious objectors.

* * * * *

The occasion of testimony to the Senate by principal organizations concerned with the operation of the draft and the provisions for conscientious objectors is the unprecedented accumulation of continuing problems with the Selective Service System. Customary and normal relations with the System have broken down, and over the last several years the independent groups that monitor the nation's draft agency find it increasingly necessary to appeal to the Congress for relief from regulations and practices. Those regulations and practices, if allowed to prevail, would jeopardize the rights of registrants and even the effective functioning of a draft. Congress needs to examine whether or not Selective Service has evolved as a fiefdom operating in its own little domain, indifferent to Congress, the law, and the effective discharge of its responsibilities.

* * * * *

The National Interreligious Service Board for Conscientious Objectors represents about thirty-five religious bodies in its Consultative Council. It also interprets the interest of several other religious bodies who from principle do not formally join in such coalitions. Founded by the historic peace churches in 1940, NISBCO is the oldest and most broadly representative interreligious association in America. It now includes Catholics, Protestants, and Jews in common support of conscience and of those conscientiously opposed to participation in war.

During World War II, as the National Service Board for Religious Objectors, the agency coordinated the administration of the Civilian Public Service Camps. During subsequent periods of conscription NISBCO provided a job placement service under the new alternative service provisions.

The principal activity of NISBCO is the provision of counseling and counselor support through direct counseling and the provision of information to our supporting constituents and to the general public. NISBCO publishes the only complete and regularly updated Draft Counselors Manual, which is based on the regulations and the procedural rules for Selective Service.[1] NISBCO works to protect and to extend the rights of conscientious objectors.

NISBCO has accepted responsibility on behalf of the religious communities to be concerned about the general fairness of the operation of the draft. We are concerned therefore not only about those provisions that are specific to conscientious objectors, but also about what sort of conscription system will emerge if we have an emergency mobilization, or if we return to a peacetime draft.

We believe that the present system is not only illegal at many points, but what is worse, it is unworkable. Its implementation would cause not only grave injustices to individuals, but also it would prove insufficient to the purposes for which Congress has authorized its reactivation in 1980. At the very moment of mobilization it would be bogged down in its own processes and in legal challenges to its operation.

Selective Service continues to defy the will of Congress. Selective Service has proceeded to issue new regulations that would re-institute many of the proposals that were explicitly declared "null and void" in the 99th Congress. At that time, the House oversight committee, the HUD--Independent Agencies Subcommittee of the Appropriations Committee, said "these changes compromise fundamental rights of conscience and impose unjustifiable hardship on men seeking exemptions, deferments and alternative service." The Committee reported it believed "that the Selective Service did not act in good faith either when first publishing these amendments for public comment or in responding to these comments."[2]

We can see little or no change in that attitude. The Acting Director has actually engaged in a campaign to discredit critics of the system; in a thinly veiled reference he claims that NISBCO gives aid to Communists, and he implies that our staff might have threatened violence to Selective Service personnel. He has continued to make it difficult and costly to obtain information about the operation of the System. He argues that NISBCO does not qualify as an agency serving the general public and entitled to a waiver of fees for documents obtained under the Freedom of Information Act. He refuses to meet with either the Consultative Council of NISBCO or with the its Executive Director, on account of the latter's "mean-spirited comments" in criticism of the regulations.

The intent of Selective Service with respect to revising the regulations is reflected in the attitude of its officers about the regulations themselves and the right of public scrutiny. The

Acting Director, Col. Wilfred Ebel, and the General Counsel, Henry Williams, have testified that they do not have to publish recisions of regulations in the Federal Register. They say, in effect, that the general public and the legal system have no right to know. As a result, the legal status of the rules governing Selective Service has been in doubt for the past year, and very likely will continue to be so.

The present Selective Service System still does not implement the reforms that were mandated in 1971 amendments which aimed at greater fairness (PL 92-129)[3], nor the 1979 amendment to the Military Selective Service Act when independence from the Department of Defense was expressly required (PL 96-107).[4] The training of local boards has proceeded in a way that NISBCO believes would encourage local claims boards to make decisions unfairly.[5]

Now that talk of reviving the draft has resumed with seriousness, and health care professionals, including women, are likely to be registered at a future time, it is incumbent on the Congress to determine what has happened in drastically redesigning the draft during the last six years that this Administration has been in charge. NISBCO believes that an unacceptable militarization has taken place at the sacrifice of "fundamental rights of conscience and impose[s] unjustifiable hardship on men [and women] seeking exemptions, deferments and alternative service."

SSS Reissuing Regulations Declared "Null and Void"

Selective Service has reissued some regulations and proposes to issue other regulations which were declared "null and void."[6] The reasons provided do not improve over the vague ones provided earlier to justify changes in the regulations, "inopportune" and "improvident." The history of this legislative recision of regulations is important, not only for the record, but to understand the issues in contention between SSS and critics:

In 1985 Selective Service issued a series of regulations over the year-end holidays. Those regulations were published for thirty days of comment; the rule in force in the publication of Selective Service regulations is sixty days for comment. Despite the fact that General Turnage had been issuing regulations during his tenure, he testified later that he did not know that sixty days was the regular practice. The timing of the publication, December 27, when many campus ministers, interested registrants, religious officials, and other members of the public who follow Selective Service developments would be preoccupied with holiday activities and travel was also suspect. Members of the oversight committees did not find out about the regulations until they returned from recess, if at all.

NISBCO characterized those regulations as contrary to statute, legislative intent, and to case law. Despite letters and calls from the affected community, some of whom received notice with only a few days left for comment, Selective Service did not extend the period for comment until Congressional pressure forced them to extend the comment period to sixty days.

Among the problems in the regulations that were proposed were un-lawful limitations on the classifying authority of the local boards, limitations on the right to appeal, closing of Board hearings to the public, elimination of the provision of any independent assistance to registrants, failure to provide conscientious objectors with rights enjoyed by other registrants, and new notions that conscientious objectors had to undergo military jurisdiction (military physical and mental examinations) to obtain the right to have their claims heard. Regulations that were intended to assure impartiality in treatment were removed and revised. Over seventy comments were received at Selective Service within the time limit. Other comments arrived after the comment period and were not counted.

One most frustrating aspect of the regulations was one governing who could provide alternative service for conscientious objectors. In 1971, Congress had specifically directed SSS to continue the programs with religious employers. In 1983 several traditional employers of alternative service workers met with Selective Service officials about providing such opportunities again. They were engaged in such talks since Congress at NISBCO's insistence forced SSS to completely revise its alternative service "program" which had been proposed to operate under the priorities of the Federal Emergency Management Agency with the Labor Department. At a meeting with Selective Service the Mennonite Central Committee representatives were told they were agents of the government and their requirements for participation in their Mennonite Volunteer Service would no longer qualify them for taking COs in their work program. At the suggestion of Selective Service the Mennonite Central Committee provided a legal memorandum in support of its position.

Despite efforts by letter and by phone for over a year to gain a response from Selective Service to the memorandum on behalf of MCC which had been prepared by the distinguished legal authority on church and state relations, William Ball, no answer was provided. The only answer provided was the regulation published to bar them. NISBCO, the MCC, the Church of the Brethren, and Pax Christi (the Roman Catholic peace organization), together with the Central Committee for Conscientious Objectors, all testified May 8, 1986 against the new regulations, including this one. Others submitted written testimony. The next day Selective Service sent to the Federal Register the regulations unchanged for promulgation on May 14th.

That July the House Subcommittee reported out H.R. 5313, and soon obtained the agreement of the Senate Subcommittee. Senator Garn expressed concern that the Committee had not been informed of the regulatory changes. The bill was incorporated into the Appropriations Act, PL 99-500 and was signed into law by the President October 18.

Selective Service gave contradictory responses. One spokesperson said they were surprised that the regulations were revoked. He indicated to the press that immediate action to implement the revocation would take place, notifying all concerned. Instead, the Director circulated personnel in Selective Service telling them the 1985 regulations were in force, and that the training materials for the summer would be little affected. There was no action to rescind the regulations officially in the Federal Register.

Failure to notify officially through the Federal Register leaves the 1986 version of the Code of Federal Regulations appearing to be in effect. On the contrary, there were gaping holes: provisions affecting the Presidential appeal board, the order of call, the classification authority of the local boards, the definition of classifications, the rights to appeal, the authority for ordering registrants to examination, the requirement to report change of address and status, and the provisions for hearing and assigning conscientious objectors to alternative service employers. By magic, as it were, the regulations that were made null and void had been replaced by another set which had been revoked when the 1986 set was promulgated in the Federal Register. When NISBCO petitioned Selective Service for rule-making to correct this situation, the General Counsel said he did not have to since the Administrative Procedures Act did not apply to his agency. He gave NISBCO the same reason he gave the House Subcommittee February 19, 1987, he could not improve upon the statute. It would seem that he has an obligation to implement it.

NISBCO refers attorneys, pastors, counselors, and registrants to the Code of Federal Regulations in their local library to find the rules governing them and Selective Service. Under this administration it is not possible to do so. There is no record in the Federal Register of the action of Congress in 1986. Now that Selective Service has begun to issue new regulations it is pretending that it is revising some preexisting regulations, but it does not tell the reader in the Register that the reference point is a discarded volume of the Register from 1985. SSS is actually adding new regulations now, for if they have been declared "null and void" there are no regulations to "revise."

New Regulations

The new regulations being issued have some improvements. The provision for open hearings with the permission of the registrant is proposed to be restored. Conscientious objectors are to be given the same rights for postponements, including religious holidays, that other registrants have. Provisions have been restored which mandated non-discriminatory administration of the rules, especially with respect to deciding hardship claims. Registrants will be allowed an automatic transfer to a more convenient local board for a "courtesy hearing" to be classified.

Two regulations that were central to the legislation that they are "null and void" still present problems. Congress needs to clarify the situation before there is a draft.

The prohibition of some traditional placements for conscientious objectors (§ 1656.5(a)(1)(iii) may be reinstituted, according to statements from both the Acting Director and the General Counsel. In the meantime, it remains in the Code of Federal Regulation, since it was never rescinded there. The requirement that CO's must have a military physical to determine whether or not they are acceptable for military service before their claims can be heard appears to be subject to waiver under a new regulation (§ 1630.16(b); but, the final version appears to make it impossible for the waiver to apply to those who then seek to enter alternative service. Another regulation (§ 1633.1(f)) specifies that a CO claimant cannot be considered for 4-F except by submitting to the military physical examination, and that the determination of un-acceptability can be made only by the Secretary of Defense. The Director can order **any** registrant to a physical (in the new, and shorter period of seven days)(§ 1624.10), notwithstanding the waiver of examination now proposed. What regulation applies?

The Military Selective Service Act at § 6(j) expressly excludes COs from liability for induction (acceptability for military service) saying: "Nothing in this title shall be construed to require any person to be subject to combatant training and service...or if he is found to be conscientiously opposed to participation in such combatant service, in lieu of such induction," [etc.]. Since long-standing practice in the Selective Service System had allowed COs to volunteer for their alternative service, local boards should still be able to determine the un-acceptability for military service "under standards prescribed by the Secretary of Defense"[7] and permit COs to enter alternative service without being "found acceptable for military service."

NISBCO has commented at length on these regulations in successive submissions to the Selective Service System. The extensive arguments citing precedent and first amendment interpretations were not responded to by SSS in its summary of the comments and presentation of its reasons for promulgating the regulations.

Other regulations which have been commented on for their deficiencies are also promulgated or proposed:

1. Elimination of a listing at the area offices of volunteer advisors, the last vestiges of independent assistance to registrants. § 1618.3
2. A new order of call would subject registrants 26 to 35 who have lost a deferment or no longer qualify for an exemption to being drafted first, contrary to Congressional intent[8] and previous regulations, which implemented a youngest first order of call while preserving the extended liability of those who had held deferments (not exemptions). § 1623.3(c)
3. A unique discrimination against conscientious objectors who are overseas is embodied in a requirement to travel at their own expense for a mandatory personal appearance to have their claims heard. Some COs would be working at subsistence in overseas service projects and would lack the funds for such travel and lose their right to be classified. The government would pay to have them travel to be inducted instead. § 1657.6(b)
4. All COs are subject to a requirement that without their request which is required in other judgmental classifications they are automatically scheduled for a mandatory personal appearance. If the registrant cannot appear at the hearing, his hearing will not be automatically rescheduled. If the local board does not like the reason given, his claim can be thrown out.
5. A registrant can have his claim for 4-F reviewed by the local board, as with other administrative classifications made by compensated employees of the Area Office. But the local board can do nothing about it. This restriction is contrary to the statute.[9] § 1633.1. §1633.1(f)
6. No appeal can be made from a unanimous decision of a local board in its review of an administrative claim, despite comments that such an appeal has been successful in the past due to the error of the local board. § 1633.2(d)
7. Advisory opinions about whether an individual is obligated to register for the draft will be issued, implementing the amendment of the MSSA at § 12(g). No notice will be given to a registrant that such an inquiry has been made. § 1698
8. The independence of the Presidential Appeal Board from the Director of Selective Service has been eliminated. § 1605.6(g)

Suggested oversight committee actions

A. The oversight committees of the Senate and the House should review these changes in regulations with the comments submitted to Selective Service in hand to determine whether or not the statute, Congressional intent, and case law are being complied with. The Registrants Information and Management System should be closely studied for consistency with the law. The investigation should give special attention to whether or not fairness in administration, civilian control, and unbiased treatment of conscientious objectors are being maintained.

B. If Selective Service has reissued regulations revoked by Congress, without amending to accommodate the objections, they should again be declared "null and void."

C. If investigation reveals that Selective Service in failing to give notice in the Federal Register of the revocation of regulations legislated by Congress in 1986, the agency should be required to comply with the requirements of the Federal Register leading to proper compilation of the regulations in the Code of Federal Regulations.

D. If investigation reveals that Selective Service has restricted access to its information improperly in the case of NISBCO (or others), refusing to meet with it and its officers, requiring improper fees for copies under FOIA requests, and seeking to impair its reputation with SSS personnel and restricting their right to communicate with NISBCO staff, SSS should be directed to return to the proper standard of conduct by government officials.

A Possible Explanation for the Practices of Selective Service

This furor over the regulations and other practices of Selective Service would not be necessary were the Acting Director to be candid about the relation of the Department of Defense to the operation of Selective Service. When Secretary of Defense Casper Weinberger came into office he indicated that Selective Service was part of his jurisdiction. Indeed, it has become so. The Acting Director and his Chief of Staff have come to Selective Service from positions in manpower at DOD. They are implementing the recommendations of a 1978 DOD scheme for revising the draft.

That document, "A Proposal for a Wartime Draft System," urged "a start from scratch with a completely new law which would provide express sanction for the measures incorporated [in the proposal]." DOD saw the need for casting aside "old practices and existing law." The law was never changed but the proposals have been implemented, which should have required a new law. SSS has been legislating by regulations what it could not accomplish directly with Congress, and it is not telling Congress what it is doing.

That proposal set up the sequence of selection and examination first, then classification and adjudication. It thus put classification at the last possible moment, despite the statutory requirement "of as soon as practicable." Despite the estimated cost of $100 per examination, and in contrast to the operation of a draft boards by volunteers, the arrangment was thought to be more efficient, even if less just.

The limitation of deferments was there advocated and the assignment of COs by the Labor Department designed. The by-passing of state offices and local board offices was designed through a system of regional and area offices taking their places. The use of military personnel instead of civilians was provided. All these elements are in place except for the defeat of the Labor Department control of COs.

The use of military personnel to operate the system is pervasive. The initial staffing of all significant positions will be by reservists on active duty and by recruiters. Conscientious objectors will be assigned to their duties by military officers despite the statutory requirement that their work is to be under civilian direction. This creeping militarization of the System is unacceptable to the religious bodies, and especially to conscientious objectors, many of whom are conscientious objectors to military oversight and control.

In the light of real options for civilian control of Selective Service, the militarization should be reversed, and the regulations completely overhauled. At the very least an independent and civilian operation of conscientious objector assignment and review should be required.

Basic Information Is Still Unavailable

During the last several years NISBCO, and the House Subcommittee have urged that more information be made available to registrants and others concerned, including the general public. Selective Service has just made available the booklet, Information for Registrants, for those who write Pueblo, Colorado.

NISBCO has sought copies of the booklet for its counseling work, and for the member religious agencies. Selective Service offered copies to NISBCO equal to the number of registrants receiving our monthly newsletter. When NISBCO could not provide such a number since we do not keep such records, Selective Service refused to provide the booklets. The Fellowship of Reconciliation was refused a quantity request. The Central Committee for Conscientious Objectors was supplied with copies in quantity. There is no rational basis for the policy.

The booklet itself, while much improved over earlier versions, is not up to date, nor does it provide information about appeals. The printing is insufficient to distribute to registrants seeking information at the local post office, which is where they are to obtain it in a mobilization.

In addition, we have mentioned above the refusal of Selective Service to provide NISBCO a waiver of fees for documents requested under FOIA; SSS claims that NISBCO does not qualify as serving the general public. SSS thus is requiring NISBCO to seek injunctive relief in a matter that has already been decided in other cases. NISBCO has sought regular copies of newsletters circulating in SSS, the Board Reporter and the Board-O-Gram, and has been refused. The information policy and practice are not at the standard appropriate to a Federal agency.

Whatever can be done to open up communication between Selective Service and the general public, especially NISBCO, would be helpful. NISBCO is ready to supply the Committee with detailed information, including copies of regulations and comments, as the Committee has need of them. We would be willing to place the Committee on our HOTLINE list to give notice of publication of new regulations together with our analysis.

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[1] The administrative procedures of Selective Service are contained in a manual, the Registrants Information and Management System, (second edition, 1984). An edition based on the 1986 regulations was not made available since those regulations were at points declared "null and void."

[2] Report accompanying H.R. 5313, at p. 53.

[3] Military Selective Service Act, Sec. 22, "to guarantee to each registrant asserting a claim before a local or appeal board, a fair hearing . . "

[4] The Military Selective Service Act was amended by adding Sec. 1(f), "The Congress further declares that the Selective Service System should remain administratively independent of any other agency, including the Department of Defense."

[5] Local boards have been trained to find "any basis in fact" to reject CO claims to meet the standard in Cox for denial of review of draft cases. That standard for judicial review should not be confused with the standard to be applied by Selective Service in the initial determination of claims "consistent with the informal and expeditious processing which is required by selective service cases." MSSA, Sec. 22(a) The standard should be at least "the preponderance of evidence," if not "clear and convincing evidence." After all, if SSS finds even one fact against the registrant, "demeanor" is suggested, the registrant can be found guilty of refusing induction and there is no judicial review of Selective Service's determination. See NISBCO's leaflet on "Reading the Fine Print."

[6] Final regulations and proposed regulations were published in the March 20, 1987 Federal Register, Vol. 51, No. 237.

[7] The regulatory language for the Army Surgeon General's standards C 32, AR 40-501 implementing the provision in the MSSA at Sec. 4(a) and at Sec. 6(h): "The President is also authorized, under such rules and regulations as he may prescribe to provide for the deferment from training and service in the Armed Forces . . . (2) of any or all categories of those persons found to be physically, mentally, or morally deficient or defective."

[8] See Report No. 92-82, House Armed Services Committee, page 11.

[9] The statute gives the local board "power . . to hear and determine . . all questions or claims with respect to inclusion for, or exemption or deferment from, training and service under this title . ." MSSA, Sec. 6(h)

STATEMENT OF JAMES FELDMAN, CENTRAL COMMITTEE FOR CONSCIENTIOUS OBJECTORS

Senator PROXMIRE. Mr. Feldman?

Mr. FELDMAN. Mr. Chairman, I thank you for giving me the opportunity to testify on behalf of the Central Committee for Conscientious Objectors. CCCO was founded in 1948 to protect the rights of individuals conscientiously opposed to participating in war.

Today, we are the nation's largest draft counseling organization committed to providing nondirective counseling along with reliable information concerning registration and the draft.

Since 1980, Selective Service has done its best to produce a streamlined system which it claims can provide 100,000 men to the military within 30 days of mobilization.

SWEEPING CHANGES ADVERSELY AFFECT CO'S

It has put less effort into ensuring that this system treats registrants fairly and with respect. We ask that you require Selective Service to make the changes necessary to accomplish this. Last May, as Reverend Yolton just explained, the agency adopted sweeping changes in its regulations which adversely affected the rights of registrants in general, and conscientious objectors, in general.

Congress subsequently declared these regulations null and void. This March, Selective Service published sets of final as well as proposed regulations. I discuss the significant improvements and remaining problems in my written testimony.

SUMMARY OF CRITICAL AREAS

At this time, I would like to simply summarize several critical areas of concern, and I refer you to our written testimony for more details. Of course, we are happy to provide more information as at the Subcommittee's request.

We are concerned about the order in which Selective Service now intends to draft men. As it did in May, the agency proposes to first draft individuals whose exemptions and deferments have expired. This plan would create the confusion and uncertainty that Congress developed the lottery system to avoid. It is simply unfair to keep men in limbo for 14 years. Selective Service has provided no compelling reason for this major change. No one in the extended liability group has been drafted since World War II.

We are concerned with the loss of civilian control over the agency. The law gives civilian boards all power to classify registrants. Selective Service would strip them of this power when it comes to 4F or unfit for military service classifications.

We are concerned with Selective Service's proposal to prohibit appeals of unanimous denials of claims for administrative classifications.

During the Vietnam war, many unanimous decisions by local boards were overturned on appeal. We see no reason to expect different results under the current system.

We are concerned that CO's will not be treated fairly. Selective Service, once more, proposes to drop the automatic rescheduling of personal appearances before local boards for conscientious objectors. This protection is necessary as long as CO claims require personal appearances. Applicants for other classifications who miss their personal appearances will still have their claims decided by boards based on evidence in their files.

If Selective Service is going to do away with automatic rescheduling, it should give CO's the same rights as it gives applicants for other classifications. Selective Service once more proposes to refuse to pay transportation costs for overseas registrants to and from personal appearances before the local and appeal boards.

In the case of CO's, this regulation is particularly egregious, since CO claims will not be granted at all without personal appearances. This regulation puts a price tag on conscience and amounts to religious discrimination.

Beyond these specific problems is the overriding problem caused by the way Selective Service has chosen to handle Congress' nullification of last May.

Selective Service's refusal to publish in the Federal Register any notice of the nullification would cause mass confusion in the event of a mobilization. If preparation for such a mobilization has been used to justify registration, Selective Service's lack of concern with providing proper public notice is distressing.

While Selective Service has made some positive changes, there are many problems which remain. We urge you to take whatever action is necessary to ensure that Selective Service provides registrants with the rights and respect they are due by law.

Senator PROXMIRE. Thank you very much, Mr. Feldman.

ADDITIONAL PREPARED STATEMENTS

[The statement of James H. Feldman, Jr., together with statements of The American Legion and the National Guard Association of the United States, follow:]

STATEMENT OF JAMES H. FELDMAN, JR., STAFF ATTORNEY, CENTRAL COMMITTEE FOR CONSCIENTIOUS OBJECTORS

I am James H. Feldman, Jr., staff attorney for the Central Committee for Conscientious Objectors (CCCO). CCCO was founded in 1948 to protect the rights of individuals conscientiously opposed to participating in war. Today, we are the nation's largest draft counseling organization. Our network of over two thousand draft counselors stands ready to counsel young men concerning their legal rights and obligations concerning the draft. Over the years we have assisted hundreds of thousands, if not millions of young people. Our Handbook for Conscientious Objectors, generally recognized as one of the standard works in the field, has alone sold over half a million copies since it was first published in 1952. We pride ourselves in our commitment to providing non-directive counseling along with reliable information concerning registration and the draft.

While CCCO is now, and has from its inception been opposed to military conscription, so long as the Selective Service System exists, we will work to protect the rights of those individuals who by law are required to register with it. It is in this spirit that I present this testimony today.

Draft registration was reinstituted in 1980, in part on the premise that it would save precious time in the event of a national mobilization. Selective Service has done its best to produce a streamlined system which it claims can provide 100,000 men to the military within 30 days of a mobilization. In the process they have run roughshod over the rights which Congress built into the Military Selective Service Act to protect registrants.

So long as young men are required to register for a possible draft, Selective Service has an obligation to develop a system which treats them fairly and with respect. We ask that you require Selective Service to make the changes necessary to accomplish this.

Registrants Need Information

Selective Service has created the impression that young men do not need to know anything about Selective Service other than that they are required to register. As a result, young people are by and large unaware that in the event of a mobilization they would have fewer than 10 days to decide how to respond. While 10 days is inadequate notice for anyone being drafted, we are convinced that unless Selective Service educates young people concerning their rights, even more young men would be illegally drafted.

Selective Service's only effort to provide such education is their Information for Registrants booklet. The readability study we conducted rated it more difficult to understand than Selective Service Regulations themselves. Compare this with the easy to read material Selective Service produces to encourage registration.

Even though this booklet is inadequate, it is the only one of its kind that Selective Service has produced. It should be widely available. This year, for the first time, Selective Service's verification letters inform each new registrant of its availability. This helps new registrants, but not those individuals who need it most -- the men who turned 18 in 1985. These are the men who would be drafted first if inductions were to begin this year. Selective Service should make the booklet available to all registrants.

Not only does Selective Service not provide adequate information to registrants, they are proposing to limit registrant's access to people who can help them. Since 1982, Selective Service has provided for the listing of draft counselors in its area offices. In the March 20, 1987 edition of the Federal Register, they now propose to delete this provision.

Unfortunately, this is but a minor example of Selective Service's lack of concern with the rights of registrants. Last May, the agency adopted sweeping changes in its regulations which adversely affected the rights of registrants in general, and conscientious objectors in particular. The House Committee on Appropriations found that these changes compromised "fundamental rights of conscience" and imposed "unjustifiable hardships on men seeking exemptions, deferments, and alternative service." The Committee also believed that the "Selective Service did not act in good faith either when first publishing these amendments for public comment or in responding to those comments." Congress subsequently declared these regulations "null and void."

This March, Selective Service published sets of final as well as proposed regulations. While there are a few significant improvements, for the most part, the problems of last May remain.

Selective Service apparently intends to allow Conscientious Objectors to waive military physicals which they would otherwise be required to endure. Under the now nullified May regulations, many COs would have been required to violate the very beliefs Congress created the exemption to protect.

Unfortunately, as published in the March 20, 1987 Federal Register, Section 1630.16(b), does not permit the waiver once the CO claim has been recognized. The regulation reads in pertinent part:

> "Upon the written request of such registrant, he will be deemed acceptable for military service with examination only for the purpose of paragraph (a) of this section." (emphasis added)

Clearly, "with examination" should be changed to "without examination." We ask the Subcommittee to request that Selective Service make this necessary change.

The March regulations make several other improvements. They bring back prohibitions against discrimination by draft boards, and once more allow COs to delay reporting for alternative service when they were initially ordered to report on a religious holiday.

Regulations Continue to Disregard Registrants' Rights

In spite of these improvements, significant problems remain. Selective Service has re-proposed, without change, most of the regulations which Congress nullified last year.

The agency continues to maintain that individuals whose exemptions or deferments have expired be among the first to be inducted. (Section 1624.4(c)) They refer to Sections 6(h) and 17(c) of the Military Selective Service Act (MSSA) to support their contention that this change is necessary for them to comply with the law. (52 Fed. Reg. 8925, column one).

The proposed change is not mandated by the MSSA, and if adopted would flout the will of Congress. Under it, the many thousands of men who would receive deferments and exemptions would not know whether they would be drafted until they reached age 35. A 20 year old man deferred because of a medical problem should not have to wait 14 years to know that he is not next in line to be drafted should his condition clear up. In 1971, Congress amended the MSSA to add the lottery system in an attempt to end such uncertainty:

> "All men with ... high ... numbers can seek jobs without their employers or themselves worrying about interruption.
>
> "[C]ommunities have several layers of protections, with the youngest and occupationally least critical men drafted first."

(Report No. 92-82, House Armed Services Committee Report, page 11).

Section 6(h) of the MSSA provides that persons "deferred" under "this section" shall remain "liable" for induction until age 35. There are several important points to note in the language of this section. First of all, it does not apply to men who have been "exempted" from military service. Second, it only applies to men "deferred" under the provisions of Section 6 of the MSSA.

Selective Service goes well beyond their own interpretation of the law when they propose to draft first those individuals whose exemptions or deferments have expired.

Section 6(h) of the MSSA does not mandate that individuals in the extended liability group be drafted first. It only provides that they remain "liable" for military service. Many individuals who are liable for military service under the MSSA will never be drafted.

Selective Service is once more attempting to remove any possible civilian input from the determination of a 4-F (unfit for military service) classification. Section 4(b)(3) of the MSSA provides that "local boards shall ... have the power ... to hear and determine, subject to the right of appeal to the appeal boards herein authorized.

all questions or claims with respect to inclusion for, or exemption or deferment from, training or service under this title." Importantly, such local boards and appeal boards must be "civilian" agencies. (emphasis added).

While Section 4(a) of the MSSA does provide that registrants are to be examined under medical standards "prescribed by the Secretary of Defense," it does not mandate that the Secretary of Defense be the sole arbiter of whether those standards have been met. Selective Service's proposal contravenes the way it has itself up until now interpreted this statute.

Selective Service once more proposes to do away with the automatic rescheduling of personal appearances before local boards for COs who miss their first appearance. This protection is necessary so long as CO claims require personal appearances. Applicants for other claims who miss their personal appearance will still have their claims decided by their boards, based on evidence in their files. If Selective Service is going to do away with the automatic rescheduling, it should allow CO claims to be decided on evidence contained in the applicant's file. In the past, personal appearances were not required in CO cases.

Under the proposed regulations, registrants will not be able to appeal unanimous denials of claims for administrative classifications. Selective Service thinks that "it is unlikely that the board's decision will be overturned on appeal if the registrant had been unable to gain the support of at least one local board member." (52 Fed. Reg. 8925, column two). During the Vietnam war, many unanimous decision by local boards were overturned on appeal. It is easy to see why in many cases a unanimous decision might be overturned. Board members do not have access to copies of the MSSA or Selective Service Regulations. In the event that the RIMS (Registrant Information and Management System) Manual incorrectly interprets the law or a regulation, it would be unlikely that any board member would be aware of this. It is not a farfetched notion that the RIMS Manual might be inaccurate. It is outdated today.

Selective Service once more proposes to refuse to pay transportation costs for overseas registrants to and from personal appearances before a local or appeal board. In the case of COs, this regulation is particularly egregious since CO claims will not be granted without a personal appearance. This regulation puts a price tag on conscience, and amounts to religious discrimination. The failure to provide transportation costs for other claimants amounts to economic discrimination. While their cases will be decided based on information contained in their files, in most cases, the presence of the claimant at his hearing will strengthen his case. Cases should be decided on their merits, not on whether the claimant has the money to attend a hearing. Perhaps Selective Service is under the impression that all young people living overseas are wealthy. This is simply not so. Many will be overseas doing voluntary relief work.

Beyond these specific problems is the overriding problem caused by the way Selective Service has chosen to handle Congress' nullification of the May 14, 1986 regulations. Selective Service has chosen not to publish in the Federal Register any notice of the nullification. The result of this is that individual registrants, attorneys, and other members of the general public who have not closely followed Selective Service developments will be unable to determine what the current regulations are. In the event that a mobilization were called tomorrow, the number of people who would want to know how the draft would work would skyrocket. Given that the need to be prepared for for such a mobilization has been used to justify registration, Selective Service's lack of concern with providing proper public notice is distressing.

While Selective Service has made some positive changes, many problems remain. We urge you take whatever action is necessary to ensure that Selective Service the rights and respect they are due by law.

Thank you for giving us the opportunity to present our views.

STATEMENT OF THE AMERICAN LEGION

The American Legion is pleased to submit this statement in support of the full funding for the Selective Service System for fiscal year 1988 of $26.5 million in FY 88 and $26.9 million in FY 89. Our positions are based on two resolutions passed unanimously by the 68th National Convention of The American Legion. Copies of the resolutions are appended to this statement.

Since 1972, the Armed Forces of the United States have depended on volunteers to meet their congressionally authorized end strenghts. While recruiting efforts have generally kept pace with manpower requirements, Congress must now grapple with the need to adequately provide for future manpower demands. Recently, in this regard, attention has begun to be focused on the severe shortage and availability of military medical personnel should war break out. The lack of adequate military health care for wartime casualties is not a new problem. As early as 1981, a GAO report indicated that 9 out of 10 of our soldiers would die from a lack of prompt medical attention.

Today, this problem is so serious that the House Armed Services Committee recently warned in its FY 88 Defense Authorization Bill, that,"...the committee views medical manpower shortages as serious warstoppers." Indeed, the United States would suffer heavy and unacceptable losses in a major war because we currently lack the capacity to properly care for the number of casualties that can be expecated to occur from a major out break of hostilities, thus placing many military lives in jeopardy.

The Armed Services Committee has, of course, taken a number of steps to solve this critical problem. One step in particular involves the Selective Service System. In its authorization bill the committee included a provision directing the Selective

Service to implement a system for the post-mobilization registration of health care professionals. Under this plan, the Selective Service would not actually register doctors, nurses, and other medical personnel. Instead, the Selective Service would design a computer program to facilitate registration in the event of a national emergency. To accomplish this goal it is estimated that the Selective Service System will need an additional $1 million. Therefore, we asked that you add the necessary funds to the FY 88 appropriation bill to enable the Selective Service to begin work on developing this program.

Mr. Chairman, the Legion feels that the dangerous world in which we live demands a Selective Service System which can deliver the first draftee to a military training station within 13 days of a call for general mobilization and as many as 100,000 men within 30 days after mobilization has been declared. In addition, we believe that the registration system currently operated by the Selective Service, and which will be improved by this standing medical program, is an essential element of preparedness which will ultimately prevent hostilities in the first instance, or, at least, lead to a conclusion of hostilities in terms favorable to the United States should deterrence fail. Our national resolve, as evidenced by the number of troops available to the Armed Forces through the Selective Service System will send a powerful message to any nation willing to risk an armed conflict with this country.

SIXTY-EIGHTH ANNUAL NATIONAL CONVENTION
OF
THE AMERICAN LEGION
SEPTEMBER 2,3,4, 1986
CINCINNATI, OHIO

RESOLUTION NO.: 423

SUBJECT: SELECTIVE SERVICE SYSTEM

WHEREAS, The defense of the nation requires the maintenance of a system of military manpower procurement equal to meeting the needs of present and forseeable defense commitments as well as primary mobilization demands; and

WHEREAS, The Selective Service System has proven itself to be fully effective in meeting the vital national needs during all wars this nation has been engaged in during this century, as well as the requirements of the peacetime Army since World War II until 1973; and

WHEREAS, The current registration program has been highly successful; and

WHEREAS, A viable Selective Service System with registration is the minimum to meet the necessary mobilization requirements; now, therefore, be it

RESOLVED, By The American Legion in National Convention assembled in Cincinnati, Ohio, September 2,3,4, 1986, that we support: (1) the maintenance of the Selective Service System as a viable preparedness measure; (2) the continuation of the current registration program; (3) supports local boards in a registrant's own community having the responsibility for determining his availability and the issuance of induction orders rather than depend on an untried, centralized computer system; (4) supports the training of Reserve and National Guard personnel in Selective Service Manpower Mobilization Procedures with the capability to rapidly expand these forces by resuming inductions should world conditions ever require Congress to return to the draft; and, be it further

RESOLVED, That the President and the Congress be urged to provide the necessary support for the Selective Service System so that the mandates of the Military Selective Service Act are enforced and the Selective Service System is able to meet the manpower requirements of the Department of Defense when called upon.

SIXTY-EIGHTH ANNUAL NATIONAL CONVENTION
OF
THE AMERICAN LEGION
SEPTEMBER 2,3,4, 1986
CINCINNATI, OHIO

RESOLUTION NO.: 424

SUBJECT: MILITARY DRAFT

WHEREAS, Thirteen years have elapsed since the United States initiated the effort to meet its military manpower requirements through the concept of an all volunteer force (AVF) with a standby Selective Service System theoretically capable of quick reactivation to provide in an emergency; and

WHEREAS, Several underlying assumptions on which those manpower policies were based have changed since the AVF began in 1973; i.e., as stated by the Senate Armed Services Committee; "Soviet military capabilities have increased substantially in terms of quality and quantity of manpower; quantity of sophistication of materials; command control, communications and intelligence capabilities"; and

WHEREAS, All services are, at the moment, barely reaching their active duty manpower quotas; and

WHEREAS, Uncertainty for the future prevails with demographic decreases in manpower and an expanding economy; and

WHEREAS, Frequent overseas deployments and non-competitive compensation have brought pressures on career personnel that continue to drive them from the ranks in substantial numbers seriously depleting the level of professionalism through the services; and

WHEREAS, The system brings service to the nation back into proper national perspective which history has shown to be successful as a substitute for the citizen's direct involvement in his destiny in Selective Service; and

WHEREAS, Any operative Selective Service plan must be completely fair and equitable selection for all concerned; and

WHEREAS, The Military Selective Service Act, as amended, provides a fair and equitable selection system under which 95% of our young, physically qualified men have an equal opportunity to be considered for military service through a lottery system with the stringent controls over deferments; now, therefore, be it

RESOLVED, By The American Legion in National Convention assembled in Cincinnati, Ohio, September 2,3,4, 1986, that we support conscription as the primary source of personnel to meet the manpower requirements of our total armed forces.

STATEMENT OF THE NATIONAL GUARD ASSOCIATION OF THE UNITED STATES

Mr. Chairman, thank you for the opportunity to submit the views of the National Guard Association of the United States on the FY 1988 program for the Selective Service System.

We believe that the Selective Service System performs a vital function and makes an important contribution to our country's national defense. The Selective Service must be prepared to ensure that, should the United States ever enter a war in which we needed more manpower than the active and reserve forces could provide, they would be ready to quickly and equitably provide the Defense Department with the needed personnel. For that reason, we ask the Subcommittee to fully support the FY 1988 budget request for Selective Service.

We also strongly urge that the Subcommittee provide an additional $1 million for FY 1988 in order to allow Selective Service to design a system for the post-mobilization registration of health care professionals. Additionally, it is our understanding that the Senate Armed Services Committee has also decided to support this new program.

This new program was included in the House Armed Services Committee report on the FY 1988 Defense Authorization Bill, dated April 15, 1987, it is fully supported by the Administration, and we understand the Senate Armed Services Committee will also support it. Under the proposal, Selected Service would design a computer program to facilitate registration in the event of a national emergency, and develop adjudication procedures for claims and appeals in the event of registration. This new authority would not allow Selective Service to actually register or draft medical personnel, but rather it would allow them to put in place the necessary machinery should a future emergency require health care professionals to be drafted. Such an initiative would significantly reduce the time delay in startup at the outset of a national emergency.

Over the past few years, witness after witness has spoken of the dire need for additional medical personnel who would be required to treat our wounded. Some steps have already been taken and the Defense Department has stepped up its recruitment of health care personnel into the Guard and Reserve forces. However, after years of discussion and the development of new programs to solve this critical shortage, a recent Defense Department report to the House and Senate Armed Services Committees stated that the problem remains unsolved. It said, "there remains a critical shortage of general surgeons, orthopedic surgeons, anesthesiologists and nurses of all specialties. There is a current shortfall of more than 5,000 physicians in these critical specialities, and nearly 31,000 nurses."

The DoD Authorization Acts of FY 1985, FY 1986 and FY 1987 have all included incentive programs to reduce the shortages of medical personnel in the active and reserve components of the armed forces. The House Armed Services Committee Report on the National Defense Authorization Act for FY 1988/1989 recognizes "wartime medical readiness -- the ability to treat battlefield casualties and to return as many as possible to duty -- is crucial for sustaining US forces in the early days of a conventional conflict." The report acknowledges that increased congressional and DoD emphasis has brought about gradual improvement. However, the report further states that medical personnel shortages "represent a 'war-stopping' deficiency, indeed, the committee believes that every reasonable effort should be undertaken now to reduce these medical shortages."

While we are confident that these shortages can be overcome, our nation would be remiss if it did not authorize Selective Service to develop a backup system as quickly as possible to provide needed health care personnel should a major conflict break out before the shortage is corrected. All our efforts in providing adequate military manpower, equipment and training could be jeopardized if effective corrective actions are not taken.

The National Guard Association of the United States urges you to take strong, swift action to help solve this problem. We as a nation cannot ask our young men' to be prepared to fight and die for our country, without ensuring that if they are wounded they will receive adequate medical care. The proposed new Selective Service program, at a cost of $1 million, will certainly go a long way towards ensuring adequate medical care, and in many cases survival, of our service personnel. We urge the Subcommittee to appropriate the additional funds.

Environmental Protection Agency

STATEMENT OF WILLIAM BRYSON, PRESIDENT, UNDERGROUND INJECTION PRACTICES COUNCIL

Senator Proxmire. Mr. Bryson?

Mr. Bryson, I understand you represent the Underground Injection Practices Council. You might explain what that title means. It sounds pretty suspicious, you know, "the underground injection."

Mr. Bryson. We hope for good practices and better practices. I am also the intergovernmental coordinator for the Kansas Corporation Commission which is where I work and I am the president of the Underground Injection Control Program. I have provided written testimony to you, so this will be a summary of remarks.

UNDERGROUND INJECTION CONTROL PROGRAM

We are concerned basically about the funding level for the Underground Injection Control Program. It is for $9.5 million right now spread among the various 48 states.

The $9.5 million goes into a law that was created in 1974, the Safe Drinking Water Act, and one part of that expressed goundwater protection concerns from injection well practices, if you will. During the last 12 years, the procedures that people use and use of inection wells has increased immensely and improved immensely by this program.

However, there are certain areas where the Congress, in 1985 and 1986, revisited through the RCRA program of 1985. In 1985, there was concern about hazardous waste injection laws.

Senator Proxmire. I am sorry; I missed that. In 1985 what?

Mr. Bryson. In 1985 under RCRA, there was concern with hazardous injection wells in certain areas in the country. In 1986, there was concern about annulus disposal wells in a couple of states.

The program we compared with the Safe Drinking Water Act, the public water supply program and some of these others, and RCRA, and frankly, this program was about 50 percent underfunded. At $9.5 million, it is 50-percent underfunded just to do what EPA feels what we required in the 1988 guidance.

It is also about 25-percent underfunded for what we can do with our work implements now at the present time within the fiscal year 1987 budget. I think this is one of the things I might point out here very briefly, and that is that we have had a dilemma in the oil-producing states in that the fee revenues have gone down 30 percent in some of these programs.

This isn't a pitch to bolster up those oil fee funds, because obviously, they couldn't raise fees against a very depleted industry. The problem is that in the oil-producing states, oil field injection wells, when you close them down, it is not like a facility. The facility will continue running. The reservoir, the geologic reservoir will continue to flow if it has that potential. So all you do is trade one environmental problem with another.

PERSONNEL LOSS

If we have a loss of 30 percent of our personnel in some of these programs and Congress, indeed, thinks it is important to go ahead and protect ground water from injection well practices, recognizing that that is a thing that is the best method of waste disposal, then we feel that the request for additional funding for this particular program is appropriate.

Frankly, we are laying off staff in oil-producing states right now that are needed to go out and look at injection wells. This trend will continue as long as the price of oil stays down.

At the same time, there is another class of wells which is of deep concern to EPA, and that is the class 5 wells, septic tanks and this sort of thing. With that, I will close remarks.

Senator PROXMIRE. Thank you, sir.

[The statement follows:]

STATEMENT OF WILLIAM BRYSON, PRESIDENT, UNDERGROUND INJECTION PRACTICES COUNCIL

My name is William Bryson. I am the Intergovernmental Coordinator for the Kansas Corporation Commission and currently serving as President of the Underground Injection Practices Council. (UIPC). I appreciate the opportunity to appear in my capacity as a state regulator of injection well facilities to present testimony on future funding and maintenance of the Underground Injection Control Program in Kansas and other states with injection well programs.

As an example of the scope of the problem that has developed in state and federal programs which have received primacy from the Environmental Protection Agency, Kansas has 13,000 injection wells associated with oil and gas, 50 industrial waste disposal wells, and over 3,000 miscellaneous injection wells. Kansas ranks third behind Texas and California in the number of injection facilities which are regulated under the strict environmental regulation of the Underground Injection Control Program. Kansas is 85% dependent upon ground water supplies for domestic and public water supply. Preventing the future quality deterioration of these supplies is dependent upon state regulatory agencies, particularly those which, like Kansas, are major oil and gas producing states, maintaining a sound ground water protection program by a high quality field surveillance program.

Congress passed the Safe Drinking Water Act (SDWA) in 1974, as an expression of concern over protecting the nations public water supplies and in the same act, mandated EPA to develop rules as regulations for injection well practices. The states, particularly those involved in the injection of oil field related brines and enhanced recovery fluids, have made great improvements in the administrative, technical and enforcement aspects of their program. Program improvement could not have been accomplished without federal funding support for the Underground Injection Control Program by Congress. In addition, Congress revisited the concern over certain types of waste injection well practices in 1985 and 1986 when the Resource Conservation and Recovery Act (RCRA) and Safe Drinking Water Act were amended for hazardous waste injection well and annulus disposal wells respectively.

In Kansas, the Federal UIC assistance grants are divided appropriately between the Kansas Corporation Commission, regulators of the oil field related injection wells, and the Department of Health and Environment, regulators of non-oil field related injection wells. The combined UIC grant amount, plus the required state match of 25% will provide funding and operating expenses for only approximately 12 man-years effort. The current program as approved by EPA in February, 1984, requires approximately 23 man years of effort. During fiscal years 1983 - 1986 grant shortfalls were covered by additional state funding, grant "carryovers" and the Congressional "add-on" of 1986. The 1986 decline and non-recovery in the price of oil and the associated 30% shortfall in state receipts from oil and gas assessments and fees seriously curtail the number of available staff and commensurate level of funds necessary to administer the program. A continuation of present trends of reduced funding seriously jeopardize the state's ability to carry out necessary commitments to EPA developed as state grant award performance conditions. The EPA willingly admits that if they had to take over and administrate the UIC regulatory programs in all, or most of the state, they would need to hire thousands of employees (currently state employees) at a new estimated cost of $30,000,000.

Discussions with state UIC program directors have indicated the program is 50% underfunded for the number of regulated facilities and the level of implementation necessary to protect environmental and water resources. Regulations of injection well facilities requires intensive field surveillance programs to provide effective monitoring, testing and operator report verification to determine if regulatory compliance is being maintained. In addition, the decline in oil economy usually reflects an increase in environmental protection concerns because the operators experience staff shortfall at the field level or file bankruptcy. While the program is adjudged to be 50% underfunded in comparison with congressional authorization for similar federal regulatory programs, such as the public water supply program or the hazardous waste management and superfund programs, we recognize the budgetary concerns at the federal level. Congressional authorization for increasing the UIC program funding to 13.5 million per year would allow states to operate a UIC program at a level of effort approaching that originally intended and meet most but not all FY 1987 work plan commitments. Such a funding level would decrease the states ability to carry out quality assurance and monitoring programs on technical requirements which EPA and the states feel are needed to prove ongoing program effectiveness.

We sincerely appreciate the opportunity to appear before future UIC program performance and the level of program activity and funding needed to meet EPA's and Congress expectations.

STATEMENT OF DR. ROLAND WOOD, AMERICAN PSYCHOLOGICAL ASSOCIATION

Senator PROXMIRE. Our final witness is Dr. Ronald Wood, American Psychological Association on EPA.

Go ahead.

Dr. WOOD. Mr. Chairman, thank you for the opportunity to summarize my remarks. I will do my best to hit the high points of my testimony.

Senator PROXMIRE. Your testimony will be printed in full.

Dr. WOOD. I am a psychologist interested in the neurobehavioral toxicity of occupational and environmental chemicals. I am chair of the committee of the American Psychological Association that has been following the activities of EPA under TSCA.

I am here today on behalf of APA's large membership, some 87,000 members.

EPA is concerned about current and proposed levels of federal funding for the intramural and extramural activities at the EPA given the magnitude of the environmental problems confronting our country today.

HEALTH RESEARCH

Although we are particularly concerned about the adverse behavioral and neurological effects of chemical substances, our testimony today extends broadly to the health research endeavors at EPA beyond just those on neurobehavioral toxicity.

The American Psychological Association staff informs me that so far, the following professional societies have endorsed our statement: the Society of Neuroscience, the American Physiological Society, and the American Society of Biological Chemists.

In particular, we believe that EPA's Health Effects Research Laboratory and the Exploratory Research Grants Program are grossly underfunded. APA recommends that Congress approve a substantial increase in funding for EPA research on the health effects of toxic exposure. We urge the subcommittee to appropriate fiscal year 1988 funding of $31.8 million for the Exploratory Research Grants Program and $57.5 million for the Health Effects Research Laboratory.

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My comments on behavioral effects of material are covered adequately in the testimony. We continue to have great concern about this, and it has been expressed also by members of Congress and various staff members and appears routinely in news reports.

EVALUATION OF POTENTIALLY HAZARDOUS MATERIALS

We believe that Congress should provide additional funding for the evaluation of potentially hazardous materials so that appropriate standards can be established for occupational exposure, environmental release, drinking water contamination and food residues. Only with adequate knowledge can EPA prevent the broad spectrum of adverse health effects, including negative neurobehavioral effects that EPA is charged with preventing.

Recent scientific reports, however, indicate that our knowledge about neural activity is inadequate to touch on safe levels of exposure. I think Carol will put a figure in front of you.

The National Academy of Sciences addressed the need for toxicity testing and research in a report entitled, "Toxicity Testing: Strategies to Determine Needs and Priorities."

The study determined that of 5 million substances, a subset of 65,725 were characterized as substances to which humans are likely exposed. The review showed that the quality of our existing knowledge is poor: less than 10 percent of the data met the study group's standards for toxicity testing standards, and only 19 percent were judged to be adequate.

Moreover, in terms of the ability to conduct health hazard assessments, the findings were particularly grim. Only 34 percent of the pesticides reviewed have been tested adequately enough to conduct at least a partial health hazard assessment.

CHEMICALS IN COMMERCE

By comparison, the situation with chemicals in commerce is much worse. For 90 percent of these, approximately 48,000 chemicals, even a partial health hazard assessment is impossible.

The report concluded that it is clear that thousands or even tens of thousands of chemicals are legitimate candidates for neural toxicity testing or toxicity testing in general.

In light of this, in the Superfund amendments and Reauthorization Act, Congress clearly expressed its desire to communicate information about the toxicity of materials and wastes to the communities affected and would do so also under the High Risk Occupational Disease Notification and Prevention Act.

With the state of knowledge so restricted, it is likely that individuals will, in most cases, remain uninformed.

EPA is charged with a wide variety of statutes, and much of EPA's research is conducted internally under the auspices of EPA's Office of Research and Development.

EXPLORATORY RESEARCH GRANTS PROGRAM

I see I have not adequately summarized my comments here. If I can go to the last figure, this will carry the gist of my testimony. In 1981, the funding level for the Exploratory Research Grants Program was $22 million, and it has fallen to $8.4 million in fiscal year 1987. If it had been corrected for the effects of inflation, it would now be at $31.8 million, and comparable inflation erosion has occurred in the health research budget.

I would certainly like to comment on the identification program with pesticides, which may cost us three-quarters of $1 billion because of inadequate collection data on the toxicity of these materials, if time permitted. But nonetheless, as you can see, we are only investing approximately $3 million in an extramural grants program when the Federal government is having to assume abnormal costs to identify any pesticides which are consumed on the basis of adverse health effects.

[The statement follows:]

STATEMENT OF RONALD W. WOOD, PH.D., ON BEHALF OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

Mr. Chairman, thank you for the opportunity to testify concerning the FY 1988 research budget of the Environmental Protection Agency (EPA). I am Dr. Ronald W. Wood, a Research Associate Professor of Environmental Medicine at the New York University Medical Center. I am a psychologist interested in the neurobehavioral toxicity of chemicals that are present in the workplace and in the environment and am chair of a committee of the American Psychological Association (APA) that has been following the regulatory activities of the Environmental Protection Agency (EPA) under the Toxic Substances Control Act (TSCA). I am here today on behalf of APA's 87,000 members, who include psychologists with interests in various aspects of normal and abnormal psychological functioning.

APA is greatly concerned about current and proposed levels of federal funding for the intramural and extramural research activities at EPA, given the magnitude of the environmental problems confronting our nation. Although we are particularly concerned about the adverse behavioral and neurological effects of chemical substances, our testimony today extends broadly to the health research endeavor at EPA. In particular, we believe that EPA's Health Effects Research Laboratory and the Exploratory Research Grants Program are grossly underfunded.

APA recommends that Congress approve a substantial increase in funding for EPA research on the health effects of toxic exposure. We urge the Subcommittee to appropriate FY 1988 funding of $31.8 million for the Exploratory Research Grants program and $57.5 million for the Health Effects Research Laboratory.

The Behavioral and Neurological Toxicity Problem

Exposure to chemical substances can result in adverse effects on the nervous system, including impaired sensory and motor function, cognitive and intellectual performance, and emotional well-being. The occupational medicine literature is full of dramatic examples of the negative effects of exposure to these substances. One such example is the industrial chemical, carbon disulfide, which is used in rayon manufacturing. This chemical can produce disorders of vision and nerve weakness, increases the incidence of suicide, and eventually produces, a raging, raving mania. Inorganic mercury which is also used in manufacturing processes, is more subtle, producing social withdrawal, "fidgitiness", a propensity to blush, and absentmindedness. The "Mad Hatter" of Lewis Carroll's Alice in Wonderland was a caricature of this occupational malady.

Although there has been sporadic media interest in neurobehavioral toxicity in the past, the press has only recently begun to devote headline attention to this pressing problem. Recent news stories have appeared reporting complaints by individuals of behavioral effects of pesticides, such as chlordane which is used to kill termites. A Washington Post cover story on April 12 detailed how one family had to evacuate its home after the house was treated with chlordane. The family experienced a variety of complaints that are common to those reported by exposed individuals including migraine headaches, learning problems, depression, disorientation, memory loss, anxiety and irritability. Just last week, a story appeared in the New England Journal of Medicine reporting effects of lead on the nervous system of children exposed in utero at levels that were thought to be safe until now. Because of extensive research on exposure to lead, we now know that blood levels below the current critera for lead poisoning may justify removal for medical reasons of women of child-bearing age from work environments where lead exposure is likely. Furthermore, studies suggest that it may be wise for EPA to review the standards for lead exposure both from ambient air and drinking water in the general population.

Through TSCA and other statutes, Congress has indicated that such adverse health effects from toxic substances should be prevented. Widespread Congressional interest in this issue is evidenced by the hearings on neurobehavioral toxicity held in the second session of the 99th Congress by the Subcommittee on Investigations and Oversight of the House Committee on Science and Technology, and by the Education and Labor Committee on H.R. 1309, the High Risk Occupational Disease Notification and Prevention Act.

We believe that Congress should provide additional funding for the evaluation of potentially hazardous chemicals so that appropriate standards can be established for occupational exposure, environmental release, drinking water contamination and food residues. Only with adequate knowledge can EPA prevent the broad spectrum of adverse health effects, including negative neurobehavioral effects, that EPA is charged with preventing. Recent scientific reports, however, indicate that our knowledge about chemical toxicity clearly is inadequate to specify safe levels of exposure.

The Need for Toxicity Testing and Research

The National Academy of Sciences (NAS) addressed the need for toxicity testing and research in a report entitled "Toxicity Testing: Strategies to Determine Needs and Priorities". This document was commissioned by the National Institute of Environmental Health Sciences (NIEHS) to: 1) characterize the toxicity testing needs for substances to which there is known or anticipated human exposure for the purpose of regulating such substances; and, 2) to develop and validate uniformly applicable and wide-ranging criteria by which to set priorities for research on substances with potentially adverse public health impact.

The study determined that of 5 million known substances which constitute the universe of chem.cal entities, a subset of 65,725 substances were characterized as substances to which humans are likely exposed. Seven categories were identified, including pesticides, food additives, cosmetic ingredients, drugs, and chemicals in commerce at three different levels of production. The review showed that the quality of our existing knowledge is poor: less than 10% of the data met the study group's standards for toxicity testing; an additional 19% were judged to be only "adequate".

Moreover, in terms of the ability to conduct health-hazard assessments, the findings were particularly grim. The attached summary chart (Figure 1), demonstrates how deficient our knowledge is about the toxicity of chemicals in general. Despite the amount of available testing data on pesticides, only 34% of the pesticides reviewed have been tested adequately enough to conduct at least a partial health hazard assessment. By comparison, the situation for chemicals in commerce is much worse. For 90% of these approximately 48,000 chemicals, even a partial health-hazard assessment is impossible. Equally disturbing is that for large numbers of chemicals - 38% of pesticides and inert ingredients, and approximately 80% of the chemicals in commerce categories - no toxicity data at all are available. Indeed, at one point the NAS report states:

> "...of tens of thousands of commercially important chemicals, only a few have been subjected to extensive toxicity testing and most have been scarcely tested at all. Many other constituents of the human environment, including natural chemicals and various contaminants, are also potential candidates for testing. Although it can be convincingly argued that many chemicals do not need to be tested, because of their low potential for human exposure or for toxic activity, it is clear that thousands or even tens of thousands of chemicals are legitimate candidates for toxicity testing related to a variety of health effects..."

Neurobehavioral toxicity evaluation emerged from this study as one of the highest priority toxicity testing needs. For five of the seven categories mentioned above, neurobehavioral toxicity evaluation was the highest or near the highest priority testing need. Other high priority areas included testing for the toxic effects of chemical substances on human genes, reproduction and immune system function.

In the Superfund Amendments and Reauthorization Act, Congress clearly expressed its desire to communicate information about the toxicity of materials in waste dumps, to the communities affected. Congress would also inform workers of occupational hazards under the High Risk Occupational Disease Notification and Prevention Act, which is currently under consideration by Congress. With the state of knowledge so restricted, however, it is likely that individuals will in most cases remain uninformed of the hazards to which they are exposed.

The EPA Research Program

EPA is charged with the administration of the federal programs regulating air and water pollution, hazardous wastes, toxic materials, solid waste, pesticides and radiation. In order to regulate, the agency must have a data base to make informed, scientific decisions. Sometimes this data comes from the regulated industry, other times it comes from the published literature, or from the efforts of the National Toxicology Program, or from EPA itself. But EPA needs more than just data for the regulatory mill; it needs basic knowledge to formulate strategies and innovative solutions to the problems it confronts. This kind of information comes from long range research programs, not experiments directed at the chemical of the moment.

Much of EPA's research is conducted internally under the auspices of the Office of Research and Development. Within this office are some 14 laboratories, only one of which, the Health Effects Research Laboratory (HERL) at Research Triangle Park, NC, is devoted principally to the study of adverse health effects. The research conducted there includes studies of a wide range of pollutants known or suspected of causing health problems. Roughly one-third of the research focuses on air pollutants, one third on water pollutants, and the rest on toxic substances and pesticides. The major mission of HERL is to provide hazard assessment related research in support of risk assessment. To achieve this requires that the laboratory emphasize research on hazard identification, dose-response studies, extrapolation and dosimetry.

A significant source of information and new data is EPA's extramural grants program. Recognizing the lack of information needed to address current or emerging problem, in 1980 EPA's Office of Research and Development created the Exploratory Research Grants Program within the Office of Exploratory Research. This program is dedicated to the development of an effective means to stimulate extramural scientists to work on the problems confronting the agency.

The Exploratory Research Grants Program has focused principally not on the problem of the moment, but on problems that will continue to confront the agency in the years ahead. Investigator-initiated grant proposals are evaluated by a peer-review system that ranks proposals by scientific merit. Applications that pass the review of the scientific panel are then evaluated by EPA for relevancy to the Agency's mission. The combined recommendations are then ranked, and grants are awarded based on the availability of funds. The program provides grant funds in five areas: health, biology, engineering, air physics and chemistry, and water physics and chemistry. Through the health program, advances have been made recently on waterborne viral agents, the process of toxic particle ingestion, cross-species extrapolation, and toxicant-induced memory impairment.

The FY 1988 Budget: Continued Neglect or Responsible Growth?

Based on the pressing need for an improved knowledge base, APA recommends a substantial increase in funding for EPA research activities, including $57.5 million for the Health Effects Laboratory and $31.8 million for the Exploratory Research Grants Program.

For FY 1988, President Reagan proposed a budget for EPA of $4.6 billion. Despite the increasing number of environmental emergencies facing the nation, this budget contains no inflationary increase or room for growth. Under this proposal, the Office of Health (OHR), which funds the Health Effects Research Laboratory, would receive only $54.3 million. This level of support provides a negligible increase of about $1 million over the FY 1987 budget for OHR. Within this sum, the toxic and hazardous waste research budgets are actually decreased. Proposed funding for the Health Effects Research Laborartory (HERL) reflects an more dismal situation. For FY 1988 the proposed HERL budget is $40.6 million, a 5% decrease below the FY 1987 funding allocation.

APA strongly urges the Subcommittee to reject this proposed decrease in HERL funding, which would perpetuate a serious loss in HERL's purchasing power over the past six years. The HERL program consists of both intramural and extramural research. For the extramural program, there has been has been no net gain in funding since 1982. Indeed, these extramural funds, which supplement the intramural work of the laboratory through contracts and cooperative agreements, have actually declined since FY 1985. A loss of purchasing power is reflected also in HERL's intramural budget, which has been reduced from $16,500 per person in 1982 to less than $7,000 per person in 1987. This figure reflects the cost of equipment and supplies per employee (scientists and support staff). By increasing the HERL budget from $40.6 million to $57.5 million, Congress would restore HERL's ability to purchase high quality science. Such a funding level reflects the increase needed to compensate for inflationary erosion since 1981, the last year HERL's budget was based on scientific need rather than economic expediency.

The funding history of the Exploratory Research Grants Program is equally disturbing. We have prepared graphs (Figure 2 and Figure 3) to illustrate that since 1981 the dollars allocated to this program have declined consistantly. From a high of $22 million in FY 1981, funding for the program dropped to an all time low of $8.4 million in FY 1987. In fact, if funding for the Exploratory Research Grants Program had kept pace with the cost of conducting research, as measured by the Biomedical Research and Development Index, it would have been funded at $31.8 million in FY 1987, rather than $8.4 million. Similarly, the health research component of the program would have been funded at $15.5 million, rather than $3.4 million. Given the dimensions of the problem, there has been a dangerous erosion of research efforts which would help to protect human health from the adverse effects of chemical exposure.

To put these numbers into some perspective, it is useful to highlight the costs of not conducting adequate research on and toxicity testing of potentially harmful substances. Under the Federal Insecticide Fungicide and Rodenticide Act, EPA registers pesticides after it examines data provided by the manufacturers. After registering the pesticide for use, EPA frequently discovers adverse effects that require suspension of marketing of the material, indicating the adequacy of the original data and testing techniques used to register the pesticides in the first place. Under the indemnification and disposal aspects of this law, EPA assumes the cost of the suspended pesticides, as well as their storage and disposal.

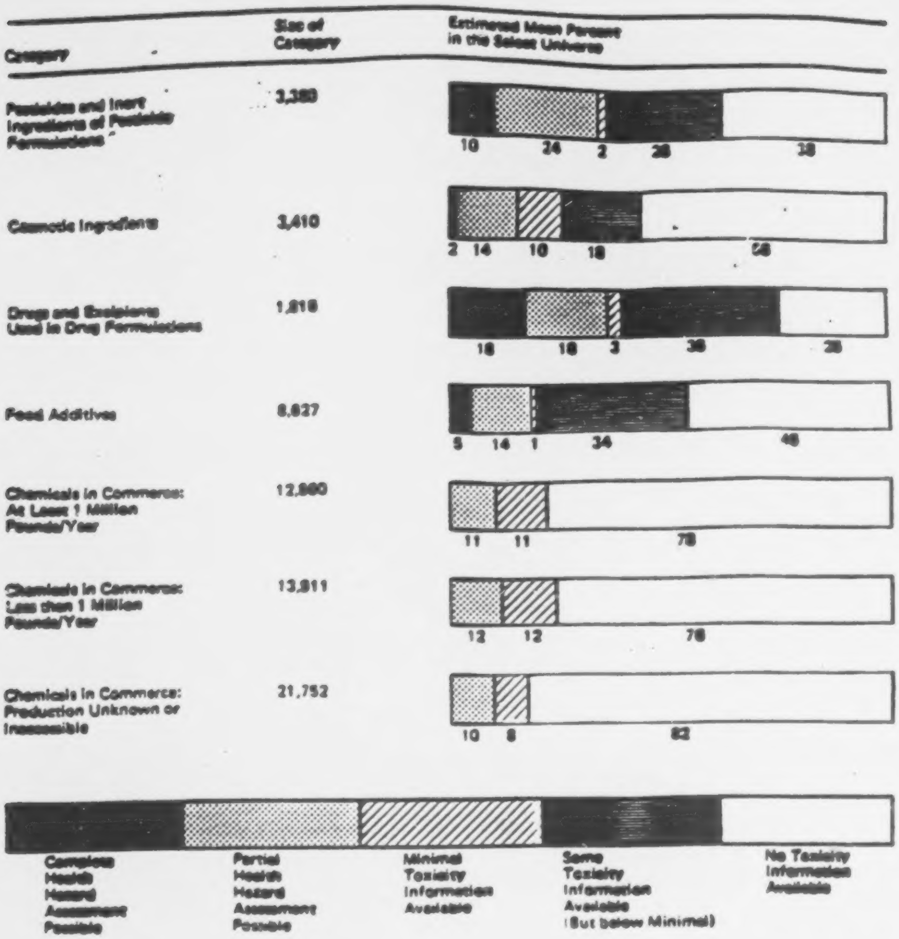


FIGURE 1 Ability to conduct health-hazard assessment of substances in seven categories of select universe.

Assistant Administrator for Pesticides and Toxic Substances, Dr. John A. Moore, stated (in testimony on April 7, 1987 before Representative Brown of the House Agriculture Committee's Subcommittee on Department Operations, Research and Foreign Agriculture) that $25-30 million had been paid in indemnities for the herbicides, 2,4,5-T and silvex. Moore also said that the FY 1987 and 1988 costs for storage of these two chemicals and EDB will be about $8 million. The indemnities and disposal costs for another pesticide, dinoseb, are estimated at $60 to $120 million. How many other pesticides will be suspended and how many tens of millions lost as better data emerges? Against this context, we reiterate that the long-range extramural health research budget of the agency was only $3.4 million in FY 1987.

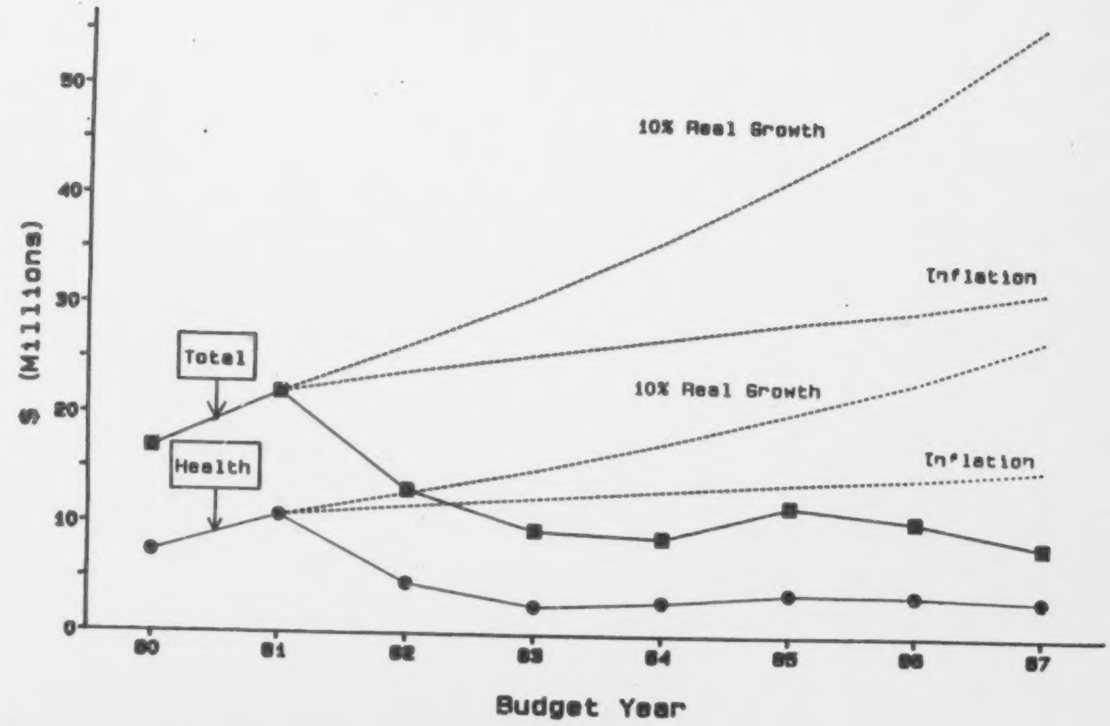
Dr. Daniel E. Koshland, in a carefully reasoned editorial in Science (October 24, 1986) asserted:

> "...The current EPA research budget is approximately $300 million, but it is almost all devoted to specific problems...The specific problems must be pursued, but basic knowledge is needed to develop broad strategies as well as innovative solutions...A tripling of the EPA research budget is not unreasonable in view of the need. This could be achieved over the next couple of years mainly through a greatly expanded extramural program. EPA would be well advised to model its research program on the successful NIH example, with most of its research in a peer-reviewed extramural program, but with a sizable intramural program as well. Because most of its research is inevitably controversial, it will gain by the outside component, both in terms of expertise and credibility..."

APA would support gradual expansion to such a program. Had the Exploratory Research Grants Program experienced moderate 10 percent real growth since its inception, its current funding level would have been $56.6 million, rather than $8.4 million. At a minimum, we urge the Subcommittee to appropriate $32 million for the Exploratory Research Grants Program and $57.5 million for HERL for the upcoming year. We believe that this level of funding is justified and urgently required to address the critical research and toxicity testing activities which should be undertaken by EPA.

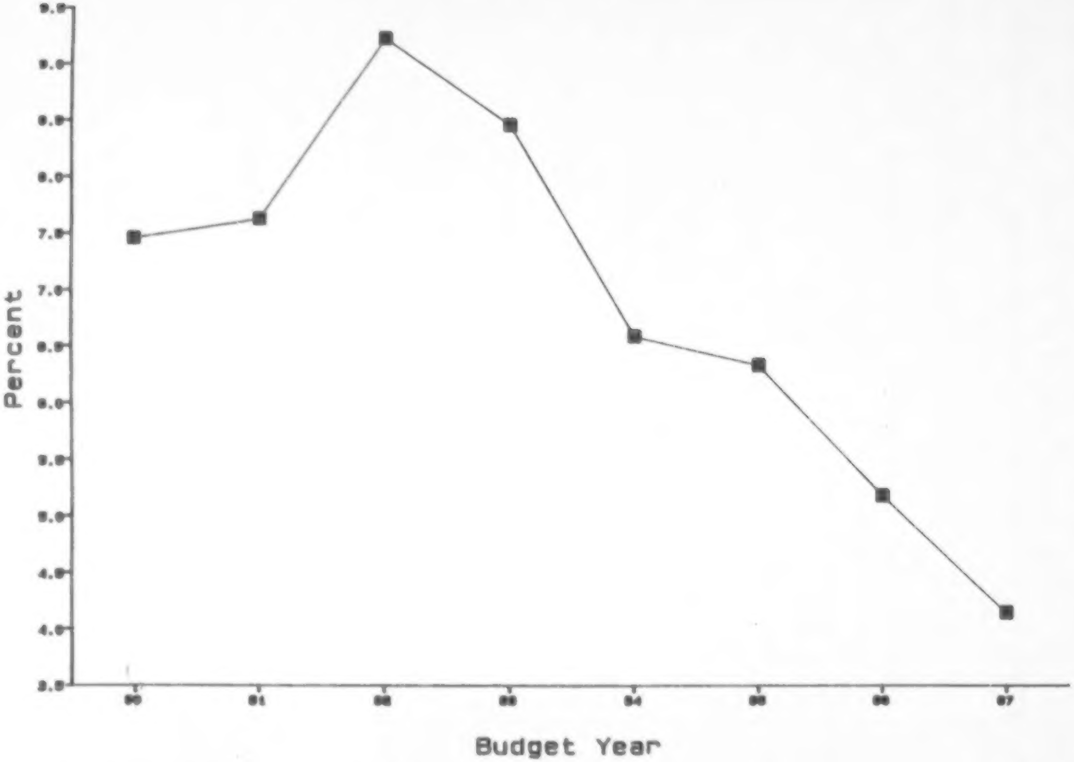
Mr. Chairman, I thank you for this opportunity to testify on these issues, and I would be pleased to answer any questions that you may have.

Figure 2: EPA Exploratory Research Grants Program



Inflation: Biomedical Research and Development Index
Bureau of Economic Analysis, Department of Commerce

Figure 3: Grants as percentage of extramural R&D



FUNDING DROP

Senator PROXMIRE. Thank you very much, Dr. Wood. That is very, very impressive. The charts you have do show a disheartening drop in funding with respect to health programs and total programs of Environmental Research Grants, particularly in real terms, allowing for inflation.

You indicated that hearings on neurobehavioral toxicity were held during the last Congress by the House committee. Was that the House Committee on Science and Technology?

Dr. WOOD. Yes.

Senator PROXMIRE. Did the committee issue any recommendations as a result of those hearings?

Dr. WOOD. Yes. They are quite detailed, and we would be happy to provide them to you. They have a wide variety of recommendations associated with expanded efforts in education and integration and into the toxic substances control.

Senator PROXMIRE. Were there any legislative proposals, any funding proposals?

Dr. WOOD. No. This was an oversight committee, and I did not see any recommendations for expanded funding.

Senator PROXMIRE. We will do our best to see if we can elicit something like that from that committee. They have obviously done a lot of work on it. You make some very impressive points.

Dr. WOOD. Representative Dingle's committee, especially.

QUESTIONS SUBMITTED BY SENATOR D'AMATO

[CLERK'S NOTE: Subsequent to the hearing, Senator D'Amato asked that the following questions be submitted to Dr. Wood for response for the record:]

Questions Submitted by Senator D'Amato

Question: I notice in your testimony, Dr. Wood, you have mentioned the price we pay for not adequately funding research on toxicity testing of potentially harmful substances. I know that EPA has paid a high price in the past for indemnification and disposal provisions under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Can you expand on this? Do you have any additional recent figures from the Agency on specific pesticides which have been or have the potential to be particularly costly? What are the ripple effects on other EPA programs?

Answer: The failure to conduct timely research on and testing of chemicals can have financial costs that greatly exceed the costs of conducting toxicity evaluation in the first place. The cost of indemnifying just 7 pesticides was estimated by EPA this spring to be $750 million. To put this in some perspective, the entire budget of the office charged with meeting EPA's research needs is approximately 300 million; the extramural research grants program has a paltry 22 million.

Without separate appropriations for indemnification, the Agency must turn to its more discretionary programs (such as research) to meet the unanticipated costs of indemnification. One may look at the adverse effects on research programs as a ripple effect of the indemnification process, but it may be more appropriate to consider indemnification payments as the outer edges of the ripples which result from not conducting appropriate studies of chemicals up front, before they are introduced into commerce and the environment.

To focus solely on these financial costs ignores the human costs of disease produced by chemicals. I will not belabor the history of human tragedies that have resulted from chemical exposure. Suffice it to say that additional costs are imposed on society to provide health care to these individuals, and as a result of the loss to the economy produced by the disease, disability, and death of members of its work force.

I would like to enclose for the record the following material, obtained from EPA, addressing these issues in detail.

COST OF INDEMNIFICATION

Question: Under existing law EPA may have to pay money to pesticide manufacturers whose unsafe products get taken off the market. If the agency decides to suspend the use of alachlor, how much would you pay in indemnities? Does the need to indemnify manufacturers change the types of actions EPA will pursue? How much money has been spent on indemnities in the last 5 years?

Answer: The Agency does not have an estimate of what it would cost to pay indemnification for alachlor, in the event that alachlor were subject to emergency suspension and subsequently cancelled under FIFRA. The cost of indemnification is dependent upon the amount of stocks available at the time the suspension action is taken, and the cost of the product paid by the purchaser. The Agency has, through Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), yearly production information on each pesticide. However, at a given point in the year, the Agency does not know how much of current production is available, and how much stock from previous years is available. Information on indemnification costs is obtained after the suspension action is taken when the Agency publishes a Federal Register notice announcing that holders of stocks should submit claims for indemnification. This information is available 6-9 months after the suspension action is taken.

However, a rough estimate of the cost of indemnification of alachlor, based on eligibility of an entire year's production, no carry over of previous years' stocks, or no overseas sales or other uses of stocks, is in excess of $300,000,000.

The need to indemnify manufacturers, dealers, and holders of suspended pesticide stock does not affect the type of action EPA will pursue. The decision to suspend is based on a finding of imminent hazard, not on benefits or indemnification or disposal costs.

The only indemnification actions which have occurred in the last five years have been with 2,4,5-T/Silvex and EDB. The amount paid for 2,4,5-T/Silvex was approximately $18 million. The current amount which has been paid in indemnity claims for EDB is $2,400,000.

INDEMNITIES FOR SPECIFIC PESTICIDES

Question: How much would you need to pay in indemnities for the following products if they were immediately cancelled in 1987: dinoseb, alachlor, linuron, benomyl, daminozide, methyl bromide and chlordane used as a termiticide?

Answer: The indemnification responsibility is assumed only when a pesticide is subject to emergency suspension (based on a finding of imminent hazard) and is subsequently cancelled. It is not triggered by ordinary cancellation. The cost of indemnification for each of these pesticides, assuming they were suspended and cancelled, can only be roughly estimated since the amount of existing stocks at the moment of suspension, the cost of purchase, and other possible uses are not known exactly. However, the following table provides some estimate of what the cost might be. The estimates assume that an entire year's production would be eligible for indeminification, and that no stock is carried over from the previous year. The estimates also assume that holders of products make no other arrangement to sell it overseas, recycle it, or in other ways recoup some of their cost. The estimates assume an average purchase price and do not include costs of storage or disposal. These figures are from published sources.

Pesticide	Pounds of Product	Purchase Price	Indemnity Cost
Dinoseb	10,000,000	$3.20/pound	$32,000,000.
Alachlor	85,000,000	$3.80/pound	$323,000,000.
Linuron	8,000,000	$8.90/pound	$71,200,000.
Benomyl	8,000,000	$19.50/pound	$156,000,000.
Daminozide	750,000	$21.20/pound	$15,900,000.
Methyl bromide	42,000,000	$1.10/pound	$46,200,000.
Chlordane	14,000,000	$7.60/pound	$106,400,000.

SPACE STATION

Senator PROXMIRE. Dr. Speser, do you agree that without the space station, there will be a brain drain to the Department of Defense? I ask the question because some have said that a big hardware program like the space station may rob money from space; is that right?

Dr. SPESER. I think that the way I would phrase it is that, let me state this.

Senator PROXMIRE. I am talking about space science.

Dr. SPESER. I understand what you are saying. Let me state here that I speak for myself only in my comments.

I would start out by noting that we have a definition that we use of a budget deficit. We say there is a budget deficit whenever you spend more money on interest than you do on civilian science, and given that, I think that we have a serious problem, and when you look at the station, I think that most NCST members would support the station, but we are are very concerned along the lines that you expressed earlier. But again, this is my perception.

There is no official policy on this, that the uses of the station are not entirely clear. If we could be sure that we are going to tighten our belts again and we would have access to the station and it would not become a military platform, much as the shuttle's access has been extremely limited for scientific flights, we would feel a heck of a lot better.

Senator PROXMIRE. If it becomes a military platform, would that accelerate the Russian scientists to accelerate theirs?

Dr. SPESER. I find it hard personally to take a lot of this seriously, sir.

Senator PROXMIRE. To take what seriously?

Dr. SPESER. This rush of scientists into Star Wars or into the military.

Senator PROXMIRE. That is where the money is.

Dr. SPESER. That is true.

STAR WARS

Senator PROXMIRE. After all, if you are going to have a situation where you have a Star Wars program that, according to the best testimony you can get before the Appropriations Committee, will cost $1 trillion, and according to the testimony by former Defense Secretary Brown, who is a world class physicist, it would cost between $100 and

$200 billion a year every year to operate, maintain and modernize it, you have to have an awful lot of scientists, and I mean tens of thousands of scientists involved in that.

Where are they going to come from?

Dr. SPESER. I think there is no question that if you pump a heck of a lot of money out into Star Wars or into military applications, there will be some people who will follow the money, and if you take that money and you pump it back in another direction, I have said this in print before, they will follow the money wherever the money goes.

Senator PROXMIRE. It is not a matter of their being materialistic; it is a matter of their going where the jobs are. A young person graduates from MIT, he goes into a program where he can get the experience, he can get the salary or he goes to a corporation that can pay, very, very well. That is what happens. We have got that kind of a system.

Dr. SPESER. There is truth in that. There is also truth that there are a large number of scientists that said they won't work with Star Wars.

Senator PROXMIRE. Absolutely, that is right, because they think the program is unsound in all kinds of ways.

Dr. SPESER. It is not simply a follow the money situation. That is where my comments were.

Senator PROXMIRE. I didn't mean that. I meant that when you have a program that is very heavily funded to the extent of hundreds of billions of dollars.

Dr. SPESER. I would be happy to see you take the Star Wars money and pump it into civilian sectors. It would make me happier personally, not speaking on behalf of the organization.

[Information supplied by Dr. Speser follows:]

LETTER FROM PHILIP SPESER, J.D., PH.D., EXECUTIVE DIRECTOR, NATIONAL COALITION FOR SCIENCE AND TECHNOLOGY

May 15, 1987

The Hon. William Proxmire
SD-530 Dirksen Senate Office Building
U.S. Senate
Washington, DC 20510

Dear Senator Proxmire:

Per our discussion at the hearing today, I am enclosing two articles dealing with the SDI program. The first, printed in Washington Technology, explains how the U.S. can accomplish legitimate national security objectives through a more innovative mix of civil sector R&D and conventional weapons and theater strategic weapons defense work. A key in this effort would be the Civilian Space Technology Initiative proposed by NASA. The second, printed in Laser Focus, notes that the SDI program contains fatal flaws in its programmatic design in addition to its problems from a scientific perspective.

With respect to your concern over the space station -- let me re-emphasize my own view that a station would be a desirable platform for microgravity research as well as for exploration uses as outlined in the Paine Commission report. However, given the sacrifices likely to be demanded from the rest of the space science and engineering community in order to build the station, it would be helpful to have a clearer statement of how the station will be used and what R&D opportunities fundamental and applied civilian sector scientists and engineers can anticipate once it is in orbit. It is my own view that a clear mission statement along the lines suggested here, together with a commitment to use ELVs and small "piggybacked" shuttle payloads to fly more science missions, will enable station development to occur without serious consequences for the civilian space science community.

With respect to the relevant contributions to station costs by the US and our allies, I would agree that a larger financial contribution (and corresponding control) by our allies need not be damaging to space R&D. Good science is ultimately international and hard to keep within national boundaries. I would point out, however, that larger contributions will lead to greater pressure to expend R&D and construction funds overseas. This consequence will limit the benefit of station expenditures for U.S. high-technology economic development. Both large and small US firms are likely to see reduced federal business and thus reduced abilities to establish early dominant positions in relevant market niches.

Please recognize that the views expressed in these two articles and this letter are my own and should not in any way be viewed as NCST positions.

Sincerely

Philip Speser, J.D., Ph.D.
Executive Director

[From Laser Focus/Electro-Optics, September 1986]

WASHINGTON REPORT

THE STRATEGIC DEFENSE INITIATIVE—A LESSON FOR TECHNOLOGY-PUSH STRATEGIES

By Phillip Speser

The Strategic Defense Initiative (SDI), sometimes referred to as Star Wars, is not your normal R&D program. As one Congressional staff member put it: "How many other program managers report directly to the President and Weinburger?"

SDI's high priority is also seen in its budget. The White House is asking for $4.8 billion for the program, although a budget somewhere in the neighborhood of $2.8 billion seems likely to emerge from Congress.

Both the access of Lt. General Abrahamson, SDI program manager, to the President and the budget for SDI reflect the President's desire to develop a shield against nuclear attack. The technical viability of developing such a shield is uncertain. Its political utility is another hotly debated topic in Washington. Indeed, the objective of the entire program is to establish the feasibility of developing a deployable nuclear defense system sometime in the 1990s. This objective requires that the program push the state of scientific and engineering knowledge and practice. Strategies requiring dramatic advances in technology are referred to as "technology push" strategies, and SDI provides some interesting lessons for agencies and corporations designing such strategies.

Organization for technology push

While technology push programs are driven by their objective, they require great flexibility and redundancy in the manner in which they pursue that objective. R&D is, after all, risky. Much of it fails. At other times, however, unanticipated results present opportunities for new lines of R&D that may lead to technical breakthroughs. In order to compensate for risk and to remain open to unanticipated opportunities, technology push programs should seek to explore several scientific and technical alternatives at one time.

To ensure that alternative approaches are explored, the Strategic Defense Initiative Office (SDIO) has incorporated flexibility and redundancy in two ways. First, the SDIO is formally structured to include both subsystem-specific offices (much laser work is conducted through offices such as Directed Energy and Surveillance, Acquisition, Tracking & Kill Assessment) and an Innovative Science & Technology Office, which cuts across all technologies and subsystem programs. Second, alternative approaches are also explored to the extent feasible within each subsystem-type office.

The Innovative Science & Technology Office seeks to provide a steady flow of new ideas and approaches that can assist the other offices in maintaining progress toward their goals. The office's task is to serve as a mechanism for additional technical flexibility in the SDIO by providing alternative ways of surmounting problems that may be encountered.

According to James A. Ionson, director of the office, "The Directed Energy Office is focusing on building better, higher-quality mirrors (for directing the beam of the free-electron laser and other laser weapons). Here we are exploring various approaches, such as phase conjugation, which may be able to compensate for poor-quality mirrors. Such approaches may provide a way around problems with optics quality that may be hit in other SDI programs."

Other on-going work of interest to laser and electro-optics companies includes research on beam combining, corrective optics, the use of lasers to strip off electrons for neutral particle beam injectors, gamma-ray lasers, x-ray lasing, chemical lasers, radio frequency (RF) linacs, and optical computing. Approximately 30% of Ionson's budget, either directly or indirectly, goes to laser and electro-optics work.

In general, work funded by Ionson's office is focusing on the physics behind such technologies and the fundamental engineering needed to construct devices. Much of the work is being conducted at federal laboratories such as the Naval Research Laboratory and Los Alamos National Laboratory (LANL). Universities are also major players. Significant opportunities also exist for companies with fundamental research capabilities.

The cross-cutting Innovative Science & Technology Office facilitates technology push by providing a systematic source of new ideas for all SDIO offices. According to Ionson, "We act as a lightning rod for new ideas." When projects prove successful, the office seeks to transfer the technology to one of the other SDIO offices. Ionson adds, "At the technology transfer stage we have to do some selling internally." The lesson here is that building in a "lightning rod" helps ensure overall program flexibility and redundancy, but it will not automatically eliminate resistance to the not-invented-here syndrome. Attention to technology transfer dynamics is still required.

FEL program uses flexibility and redundancy to progress

In order to reach its technology push objective, SDIO must make steady progress towards development of a deployable system. The burden of demonstrating progress on specific subsystems falls on SDIO's other technology offices.

The Free Electron Laser (FEL) program in the Directed Energy Office provides an example of flexibility and redundancy inside these offices. Directed Energy is organized into three areas: architecture and concept integration, basic technology, and technology integration. The FEL, the biggest laser program, is a project within technology integration. Approximately 25–30% of the Directed Energy Office's budget goes to lasers with 15–20% going to optical components. There is some overlap of work within these percentages. Other laser work includes chemical and x-ray lasers.

The FEL program has to answer three questions: first, can a working device be constructed; second, can it efficiently propagate a beam through the atmosphere—both up from the ground to orbiting mirrors which will relay and aim the beam, and back down to the target and third, can the beam be sufficiently controlled to enable a boost-phase kill?

Two approaches toward beam generation for the FEL are under examination. Boeing, TRW, and LANL are exploring RF linac approaches. The SDI program is also tracking, but not funding, work being conducted at Stanford under contract to the Office of Naval Research. An induction linac approach is being explored by Lawrence Livermore National Laboratory (LLNL). Program Director, Dr. James Bell, noted that "While the RF linac had been an early favorite, breakthroughs at Livermore have made the induction linac also attractive."

Each has its own merits. Induction linacs have attained 40% efficiency in converting electron beam energy into microwave output energy. A 10-kA beam has been produced at 50 MeV. Equally significant, the experimental results in longer wavelengths have been in agreement with mathematical models. This strongly suggests that current results can be used to indicate the viability of operating at shorter wavelengths. RF linacs at LANL have attained a 2% extraction efficiency at 10 μm with a 1.1 times diffraction-limited beam. Results suggest that running the beam 180° out of phase can lead to a 50–60% energy recovery, which can then be coupled back into the device, boosting efficiency. LANL has also demonstrated tunability in the range of 9–35 μm through changes in electron beam energy.

In FY 1987, the FEL program hopes to continue progress in both induction and RF approaches while initiating an "optical farm" test bed at White Sands, N. Mex. (see Fig.). On the induction side of the program, objectives include resolving outstanding physics issues that are likely to impact scaling up an induction device and designing a new injector/accelerator front end that will permit higher efficiencies. The Palladin experiments slated at LLNL will focus on some scaling up and moving beyond the previous microwave experiments into the infrared. Bell noted that the induction program has proceeded to the point that SDIO anticipates letting a competitive contract for an industrial partner to receive technology transfer of the device.

On the RF side of the program, plans include new designs for higher power and continued work at Boeing with the goal of moving beyond the burst mode to CW, shorter wavelengths. As with induction linacs, work will continue to address outstanding physics issues, and preliminary design and component development will be conducted.

Construction of the White Sands Optical Farm is slated to begin in FY 1987 in the Administration's budget. The optical farm will provide an opportunity for experiments involving adaptive optics and beam control, beginning with lower-power beams and building up to higher-power beams. Initial experiments will use an RF linac.

Tunability is a major factor in early work. Research on atmospheric affects is facilitated by the ability to tune in and out of absorption bands. In addition, longer waves are more eye-safe.

Regular technical reviews are used to judge progress and to keep the Directed Energy Office open to opportunities and responsive to problems. But reviews alone would be insufficient to ensure the flexibility needed for the technology push strategy. What ties it all together is the fact that, within Congressionally mandated limitations, Abrahamson has the ability to move funds around. The lesson is that parallel pathways facilitate efficient use of funds where technical uncertainty exists.

Weakness of the approach

According to sources at the Government Accounting Office (GAO), an investigative Congressional agency, if you accept the need for an SDI, the SDIO is about as well designed and managed as one could ask.

Despite this assessment, the SDI program has problems. High-flexibility, high-redundancy approaches are expensive. A recent GAO report, *Strategic Defense Initiative Program: Status of Airborne Optical adjunct and Terminal Imaging Radar* (GAO/NSIAD-86-153), suggests that the SDI strategy requires a constant trade-off between scheduling, costs, and technological flexibility and push. These trade-offs call the current SDIO technology-push strategy into question.

The GAO study examined two programs developing sensors for terminal-phase ballistic missile defense. In its assessment of one of the two, the Arborne Optical Adjunct (AOA), the GAO report says, "The AOA consists of a Boeing 767 airplane, a long wave infrared sensor with a signal processor, data processor, and other components. The objectives of the experiment are to (1) demonstrate the resolution of critical technology issues associated with the development of airborne optical sensors, (2) establish a technology base from which further optical sensor development can proceed, and (3) reduce the risk of any future full-scale engineering development. The experiment is expected to demonstrate that component technologies can be developed and integrated into a system which can acquire, track, discriminate, and transfer the data."

The Army Strategic Defense Command, acting as an agent for the SDIO, awarded a five-year contract to Boeing in 1984 for the development of two different optical sensors and related technology. The award for $416 million. Boeing, in turn, subcontracted with Hughes Aircraft and Aerojet Electro Systems for two sensors. As in the FEL program, flexibility and redundancy were built in to facilitate technology push.

Scheduling and costs cause problems

Technology push is expensive. Even before the award was made, the Army was aware that there would be cost overruns. Boeing's bid was 15% lower than the Army project office's estimate of the costs and 29% lower than an estimate prepared by SDIO.

Although a Defense Audit Agency audit of the proposal found certain labor rates and pricing factors proposed by Boeing significantly lower than those recorded on other military programs of a similar size and nature, Boeing maintained that intense management made the budget plausible. According to one insider, the Army accepted the low bid in recognition of the pressures to reduce proposal price tags now on all contractors due to the Competition in Contracting Act.

Within one year it was clear there were problems. Boeing informed the Army that there would be a cost overrun of around $103 million. The response by the Army was to restructure the AOA program by eliminating the sensor being developed under subcontract to Aerojet. The GAO states that the Army decided to go with only the Hughes sensor as it was less risky. The Aerojet sensor, though more technically advanced, represented more of a technical challenge. SDIO sources add that work on such sensors was also being funded outside of SDIO.

According to the AOA program manager, restructuring the program resulted in loss of competition in designing optical sensors of the size and type needed for an airborne system. The restructuring also meant that an important demonstration would not take place. This demonstration would have addressed the sensor-to-sensor correlation issue—that is, how do two sensors look at the same object and know they are looking at the same object—and no back-up sensor if the Hughes' design does not work.

Klein Spencer, who conducted the GAO study, said, "The message we saw in this, the first SDI project we have looked at, is that the decision will be to reduce technology when faced with problems on scheduling and costs. The problem here was not so much the overrun—as some funds had been budgeted to cover overruns—but their magnitude and how soon they occurred. The Army chose to cut back the program in order to stay within its five-year limits."

With a huge budget, cost is rightfully a major issue for SDIO. According to Spencer, "One of the things which clearly concerns Abrahamson is SDIO's capability to produce at lower costs in bulk as well as to demonstrate feasibility." Yet the cost issue and its resolution in the AOA program points out the one weakness in the SDI technology push strategy. *It requires consistent big budgets.*

The problem with SDIO's strategy is not its efforts to hold costs in line, but its initial estimates of the funds it must have. Despite vigorous Presidential efforts, Congress finds SDIO is unable to carry the burden of proof to establish its claim on massive federal dollars. In FY 1986 major cuts in funding took place. In the sensor programs, for example, the Airborne Optical Adjunct/Airborn Optical System was cut by $68 million from a requested level of $191 million; the Optical Measurements program in sensors was cut $77 million from a requested level of $199 million; and Infrared Technology was cut $71 million from a requested level of $151 million. In Directed Energy Weapons, cuts of $121 million were made from an original request of $965 million.

Budget cuts weaken potential

In the absence of fat budgets, the flexibility and redundancy needed to maintain technology push on schedule cannot be attained. Either scheduling or technological accomplishment must give way. In a July 21 interview with *Defense News*, Lt. General Abrahamson stated: "This is the critical year. We already have made cutbacks. Major cuts would mean whittling down of the parallel choices in technologies that we can make; we did that last year. If we are not able to maintain the momentum, the best people will move out to other technical challenges. Thus we would not only have a slowdown of the program but we also would lose key people. So, there are a lot of implications of the 1987 budget."

This is a harsh reality, but it is one that the Reagan Administration forced on photovoltaic and alternative energy programs, as well as other civilian sector R&D industrial competitiveness and many university basic research programs when it first came into office. This loss of key people can also be seen in NASA today with respect to slowdowns on the space station. The arguments that Abrahamson makes concerning loss of momentum and destruction of research teams have been made by civilian sector research organizations for the past several years. The lesson here is that political or organizational support have as much to do with the viability of a technology-push strategy as technical considerations.

With a budget request more than double that of the National Science Foundation, it seems highly naive of the Administration to expect that SDIO could be sheltered from cuts. A technology push strategy that requires a fast-paced schedule and parallel paths is likely to lack support in Congress, given massive budget deficits and the need to rebuild civilian sector R&D to address serious industrial competitiveness problems.

The lesson here for government agencies and corporations is that a viable technology-push strategy requires designing alternative technology-push strategies as well as technical flexibility and redundancy within each strategy.

[From Washington Technology, October 30, 1986]

MUST SDI OBJECTIVES BLOCK ARMS CONTROL?

By Philip Speser, J.D., Ph.D.

While the arms control and national defense experts debate what happened at Reykjavik, scientists and engineers should step back and consider just what the objective of the SDI program is—and whether the objective of the program can be accomplished in a manner which does not present an obstacle to a sweeping arms control agreement.

According to DOD Secretary Caspar Weinberger in his *Annual Report to the Congress: Fiscal Year 1987*, the SDI is:

> "a research program to investigate the feasibility of advanced defensive technologies to provide a better basis for deterring aggression, strengthening stability, and increasing the security of the United States and our allies. It also seeks to reduce and, if possible, eliminate the threat posed by ballistic missiles. *This research program will provide a future president and the Congress the technical knowledge necessary to support a potential 1990s decision on whether to develop and deploy advanced defensive systems. SDIO is not a weapons development program, nor is it a program with preconceived notions of what a potential defensive system against ballistic missiles should entail.*" (Page 287, emphasis added.)

Few of us will argue with the objective of developing the knowledge necessary to establish a defensive system against ballistic missiles. Accepting the SDI objective, what then is the substance of SDI? It must be—to use Weinberger's phrase—research.

Let us assume for the moment that this research needs to be conducted. The next question is, how should we perform? Does it have to be conducted within the Strategic Defense Initiative Office or DOD? Obviously not. An examination of the research topics for programs at NSF, NASA or DOE reveals a substantial overlap between the civilian agency topics proposed to meet civilian needs and the topics under these and other SDIO program elements.

Almost every topic on the SDI list could have some or all of the basic research and generic tecnology applied research conducted at one of these agencies. NASA's Civilian Space Technology Initiative provides ample oportunities for conducting research on many of these topics. NSF's expanded programs in engineering and sciences related to industrial competitiveness also offers good opportunities.

Conducting R&D at civilian agencies has two clear advantages. First, it will not be viewed as an arms race threat by the Soviets.

Second, it allows the United States to integrate and test the technology in civilian space and earth-bound applications. It should come as no surprise that recognizing dual-use technologies enables testing—outside of the lab—significant parts of a strategic defense system without violating a ban on the conduct of tests of strategic defense weapons.

After all, the same generic technology which can be used to enable us to support a colony on the Moon or Mars can be rapidly transformed into military technology. Look at supercomputers or the space shuttle.

Remember, it is our superior knowledge base which scares the Soviets. Imagine how scared they will be after a trillion dollars of additional research and development—or for that matter several hundred billion dollars of R&D.

Few in the scientific and engineering community will argue if the White House and Congress dramatically increase NSF, NASA, and DOE R&D budgets, because they see military as well as civilian spin-offs from fundamental and generic technology research.

We need not be concerned about the R&D contractor community. The R&D contractor community will rapidly figure out how to chase RA&D dollars programmed out of SDIO just as they rapidly figured out how to chase money programmed into SDIO.

As for dissemination of sensitive information to the Soviets, it can be controlled through export licensing legislation and by performing specific, targeted military applications work in DOD—that is, along lines in existence today.

It is important to remember that the SDI was originally pieced together out of a number of smaller, ongoing defense R&D programs. Perhaps what we need is similar creativity today. We need to focus on the *objective* and *substance* of the SDI rather than the current *form* of the program. Yet a rigid adherence to the form appears in most press accounts as a key tenet of the administration's arms control bargaining position.

What could such a creative approach look like? The administration could announce it is reformulating the SDI program to enable it to better attain its objectives and to better maximize civilian spin-off. The reformulation would consist of building on civilian-sector technology where it is, or is likely to be, available. The SDIO itself would be scaled back to a study group and a program funding laboratory work and production engineering.

[From Washington Technology, December 24, 1986]

HOW THE NEW SDIO COULD FUNCTION

By Philip Speser, J.D., Ph.D.

How could the new SDIO function? Each year, prior to the formulation of broad policy objectives for the formulation of agency budgets by the Office of Management and Budget, the SDIO could issue a classified and unclassified version of a white paper on areas of need and research opportunities for strategic and intermediate missile defense. Both civilian and DOD agencies could be urged by OMB to consider spin-off SDI benefits when formulating their budgets and budget justifications. The unclassified version could be broadly disseminated to encourage the R&D community to keep SDI objectives in mind when drafting unsolicited proposals or responses to RFPs.

During the course of the year, the SDIO could pursue a more targeted study program designed to facilitate rapid transfer of technology, developed to address civilian or other DOD needs, to Star Wars applications. For example, it could hold a series of classified tedhnical meetings focusing on relevant advances in technical fields and integrating technology. It could also lend support to technology demonstration projects with SDI potential. Some examples are the construction of sophisticated laser systems for civilian earth-space communications and the use of lasers and kinetic energy weapons for meeting Soviet aircraft and cruise missile threats as well as sophisticated communications, command, and control hardware and software for air defense battle management in Europe.

The SDIO could also conduct its own program. It could fund laboratory-targeted technology development and technology integration programs. The program could establish which SDI alternatives are likely to be best suited for "development and deployment in the 1990s." They could prepare us for a rapid deployment should the Soviets violate treaties. If a nuclear threat from other countries emerges, deployment could even take place in cooperation with the Soviets—much as the president had at one time proposed sharing Star Wars.

These programs could also focus on identifying and overcoming problems in transferring civilian or non-SDI DOD technology to SDI applications. If we feel a need to keep more pressure on potential enemies, the SDIO could also compete, and award, contracts to cover costs of developing and maintaining production lines for leading defense technology contenders, thereby ensuring that manufacturability was given appropriate consideration in developing the "technical knowledge" required for a rational decision in the 1990s by the president and Congress.

In conclusion, it appears we can meet the *objectives* of the Strategic Defense Initiative in a manner which provides us with the technical knowledge the president and Congress require. It appears that creative approaches can include out-of-the-lab testing of dual use (SDI and non-SDI) components of the system as a supplement to in-lab testing of SDI specific systems. Final in-space testing can be addressed ten years from now when we know that a viable, operational srategic and intermediate missile defense system might look like. If final testing seems feasible or necessary earlier, then that issue can be addressed in negotiations with the Soviets when and if we believe in-space testing is required.

SELECTIVE SERVICE SYSTEM

Senator PROXMIRE. I would like to ask Mr. Yolton and Mr. Feldman about the points they made, and they are very good points, but the difference is, you say this subcommittee acted on this last year.

This seems to me to be a program that, to get effective results, you have to have action by the authorizing committee. Unfortunately, you know who the authorizing committees are. They are the Armed Services Committee of the House and the Senate.

I would doubt if you are going to get the same kind of sympathetic concern from the Armed Services Committee that you get from almost any other committee of the Congress with respect to conscientious objection for service. I will do what I can as a Senator.

It is very hard for me to take any action in view of the fact that of course, nobody has been drafted or will be drafted and what you are arguing for, as I understand it, is for an opportunity that if people were faced with a draft, that they could serve with a religious organization, instead, is that correct? So you see it from the standpoint of effective action by this Subcommittee and its sympathy for your position: The whole situation is, No. 1, quite hypothetical, and No. 2, the action fundamentally ought to be taken by the authorizing committee.

Mr. YOLTON. Let me respond immediately by saying in this particular case, we are not asking for legislation. All we are asking is that Selective Service follow the legislation and not legislation through regulations. That is what happened last year. Basically, both committees revoked these regulations and Selective Service has begun to reissue them. Half of them are coming out in the direction in which we asked.

They, for instance, required conscientious objectors to undergo military examinations and submit to military authority before they could even have their claims heard. That has never been the case. In that case, Selective Service has changed the regulation.

So that they also had barred information that is open hearings for local boards. They have changed that in the new regulations, and with the registrant's permission, and request, you can have an open hearing now. So Selective Service is responding.

But half of the regulations they are now reissuing are the same ones they did last year. All we are asking is that you concur with the committee in the House in revoking those regulations when that decision comes before it.

Senator PROXMIRE. I appreciate that very, very much. I am glad you clarified that. We will do everything we can to be helpful.

Did you want to comment, Mr. Feldman?

Mr. FELDMAN. Yes. I concur with everything Reverend Yolton said. But it is true, as you state, Senator, that there is no active draft right now. However, the whole justification for the registration and allowing Selective Service to develop the system right now is so that should the Congress decide that inductions are necessary that the system will be set up so that once induction begins, it is too late to make a system fair; people will already be hurt by an unfair system.

This is the time that we believe is right to create a system that will treat young men fairly should inductions once more begin, I should add, but we hope that they never do.

Senator PROXMIRE. Gentlemen, thank you very, very much. I appreciate your testimony.

SUBCOMMITTEE RECESS

The subcommittee will stand in recess until Wednesday, May 20, when we will meet in SD–138 to take testimony from outside witnesses on the proposed space station. Thank you very much.

[Whereupon, 1:21 p.m. Friday, May 15, the subcommittee was recessed, to reconvene Wednesday, May 20.]

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